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Part of the world's leading industrial corporation, ITT Business Systems has earned an enviable reputation as one of the leading suppliers in the rapidly expanding field of telecommunications and data communications and the Group's contribution to the UK's sophisticated business systems and machinery market is growing steadily with every year.

At the heart of ITT Business Systems Group is the central computer section located at ITT Creed in Brighton. The section comprises: a 1/2-megabyte IBM 370/138 operating under CICS and DOS/VS. Peripheral equipment includes an IBM System 7 for Shop Floor Data Collection, IBM 3776 RJE terminals, ITT 3280 on-line VDU's, covering several UK locations. With the expansion and restructuring of the Group comes the need for additional systems analysis and programming specialists, the men and women who will develop, implement and maintain the systems that will take us successfully into the next decade.

Senior Systems Analysts

Basically, there are vacancies in three distinct areas for Systems Analysts with about three years' experience, who have seen at least one major project through and who are now looking for their first senior appointment. Aged at least 25, probably a graduate, you'll essentially be a leader, a good communicator as well as a professional analyst.

Marketing

Customer Services systems in the areas of sales order book, finished goods inventory control and allocation, installation and maintenance control and co-ordination of field service engineers nationwide. Similar experience in distribution or in a comparable electronics firm is essential.

Finance

The Group Comptroller's function is changing to meeting increasing demands from new products, and the project involves instigating systems which account by product line. Experience in computerised financial systems is essential.



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Business Analyst

The opportunity to become closely involved in the introduction of a major new product. This is the prospect for the mature Systems Analyst, again with about three years' experience, at a different SE England location, very much in a consultancy-cum-co-ordinating role with the support of the systems staff in Brighton.

The new systems will have the complex task of covering marketing and sales order book requirements, matching equipment configuration with customer specifications, inventory control, on-site installation and maintenance.

Systems Analysts

There are vacancies in several distinct areas, but this time for men and women with a year to 18 months' systems analysis experience.

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Finance, Marketing & Manufacturing

You will be a member of the project team working in one of the areas outlined opposite.

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We operate QPAC - and the project is to co-ordinate 12 separate payroll areas in the Group, covering hourly, weekly and monthly paid staff. It's the opportunity for someone who has had programming experience or worked in payroll maintenance, ideally with QPAC, to move into systems analysis.

Salaries for all these positions are very attractive, and benefits include generous holidays and relocation allowances where applicable.

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COMPUTER WEEKLY International

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No moves by Nixdorf on Redifon's Eastern front

THE dramatic success of Redifon Computers in the Eastern bloc with its Seecheck key-to-disc system is unlikely to be challenged by Nixdorf despite the West German company's acquisition of Entrex (CW, April 28).

Entrex is the US firm that gave Redifon rights to manufacture its key-to-disc system under licence in early 1971, and

exclusive rights to sell in Eastern Europe and the UK.

At about the same time Nixdorf was awarded rights to manufacture the Seecheck system and to sell it in most parts of Western Europe as the 620 series. Nixdorf says that the Entrex contract with Redifon still applies, even though Entrex is now owned by Nixdorf, while

Redifon points out that the contract was renewed with Entrex last year for a five-year period and will not be due for re-negotiation until 1981.

However, by that time Nixdorf may have plans to move into Eastern Europe with the 620 series or derivatives of it, although the company is not prepared to comment on this.

Redifon Computers does big business in several Comecon countries, notably Czechoslovakia, where it has a permanent office (CWI, June 9) and Poland, where Seecheck is now manufactured by Mermat (CWI, January 13). It has now broken into the potentially enormous Soviet market (CWI, September 8).

● Trading with Czechoslovakia - Page 34.

Industry's plea to Australian government

THE Australian computer industry has asked the Minister for Business and Consumer Affairs to exclude all business and commercial transactions from the country's controversial Trade Practices Act.

The Act, which came into force in July, has caused all the major manufacturers except ICL and Fujitsu to suspend the signing of contracts with new customers, because they believe that the Act leaves them open to unlimited liability for the performance of their products (CWI, September 8).

The request is contained in a submission to Minister Wal Fife from CDC, DEC, Honeywell, IBM, NCR, Burroughs, Data General, Facom, Hewlett-Packard, ICL, Olivetti and Univac.

"It is our opinion," say the companies, "that consumer transactions be confined to goods or services for domestic personal use, and that in all business transactions, suppliers should be able to exclude the implied terms and to limit liability as they consider appropriate, subject to the test of 'fair and reasonable'."

Datskil contract

A CONTRACT for program conversion from ICL 1900 to 2900 has been awarded to Datskil by the Hong Kong government. The 37 programs, mainly written in Cobol, are part of the Impact stock control system for the government's supplies department.

A number of these systems are being transferred from 1903T and 1904S to a pair of 2970s.

AT&T anti-trust lawyer resigns

From Backy Barna in Washington

THE lead attorney in the US government's anti-trust AT&T trial team has resigned from the department, charging his superiors with a lack of aggressiveness.

And Griffen Bell, US Attorney-General, shortly afterwards made public his belief that Congress, not the courts, may be the proper forum in which to settle the merits of the AT&T case.

In addition to crushing the morale of the remaining government attorneys, the now-public frustrations within the anti-trust division could

persuade the Supreme Court that this case, the largest anti-trust prosecution in US legal history, may pose problems too monumental for the courts to handle.

When Philip Verveer, the lead attorney, announced that he was resigning from the suite, which is now entering its fourth year, he conceded that there are grave problems within the Justice Department.

But he declined to elaborate because "anything [one] might say would not be very helpful to the department or to the prosecution of this case."

Some of his colleagues were less reverent in their remarks. "The reason Phil is leaving," an attorney commented, "is, as he has said himself many times, that the enemy isn't AT&T; the enemy is the Justice Department."

Another disgruntled trust-buster remarked, "We are convinced we can prosecute this case and win on the merits, but I question whether the Justice Department will allow us."

This fear was given substance when Attorney General Bell recently declared that a judge

ment as fundamentally important to the US economic system as the break-up of AT&T should not be made in the "narrow frame of a lawsuit." Bell instead suggested that the anti-trust law should be circumvented by giving the case to Congress.

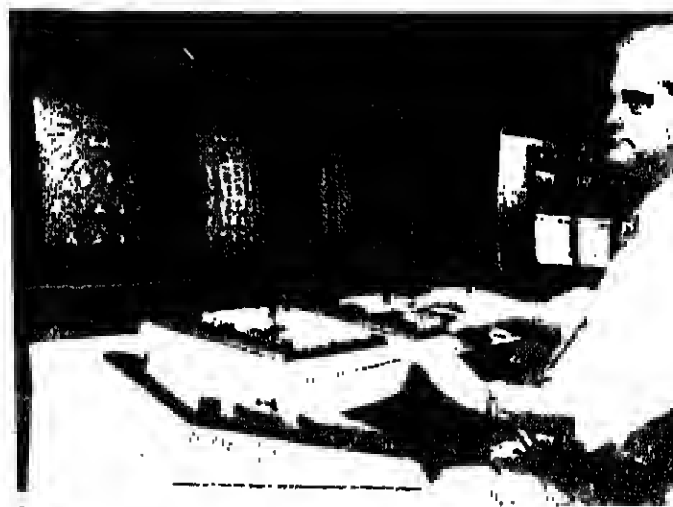
AT&T, the main US supplier of communications services, is presently appealing to the Supreme Court for a ruling that the company is immune from prosecution under US anti-trust laws since it is "pervasively regulated" on a common carrier basis.

If something is wrong with its system, the company contends, it is the responsibility of the Federal Communications Commission and the state regulatory commissions to do something about it.

A BILL aimed at giving protection to personal information held in computer systems was passed by the French parliament last week.

The Bill, which covers everything from the constitution of a national data protection authority to the size of fines for breaking the law, follows three years of government studies.

Data protection laws will cover information systems run in both the public and private sectors. The original text was restricted to computer systems, but this was amended during the parliamentary debate. Now, a manual file which is a danger to privacy either in itself or in the way it is used with a computerised file can be subject wholly



Control room of the future

What has been termed by Honeywell as a "totally integrated system" that can be applied to simple process units or to complex plants was shown on the company's stand at Intertek in West Germany last week. This situation has been reached by incorporating major enhancements to the microprocessor-based TDC 2000 Process Control System.

The enhancements include historical and real time trend recording, alarm annunciation and display, logging, VDU and

keyboard interface to intelligent multiplexors, digital start/stop operations and guaranteed system security. The latter is a Honeywell development called Uninterrupted Automatic Control (UAC) that automatically detects malfunctions from up to eight basic controllers.

Honeywell believes that the enhanced TDC 2000 will enable complete process plants to be monitored from a single VDU console station, as shown in our picture, rather than from conventional panelboard instruments.

French privacy Bill passed

partly to the new laws.

The Bill proposes the formation of a 12-person authority which will make sure the law is observed and act on complaints from the public. It will not issue licences, which are generally favoured by bodies representing the UK computer industry.

Instead, organisations will merely have to tell the authority of the existence of systems handling personal information. The list of systems will be available to the public.

When collecting personal information organisations will have to tell the person whether it is obligatory for him to give the information and who will see it. The individual will be able to demand to see the information held on him.

Penalties for breaking the law range from six months to two years in prison, and fines of between £23 and £23,000 for implementing systems without informing the authority; to one to five years in prison and fines of between £2,300 and £23,000 for illegally recording personal data.

The Bill received 289 votes, with 176 mainly Communist and Socialist votes against. A Com-

Taylor on show
ON show at the Taylor Instrument stand at Intertek, Dusseldorf, were the company's MOD 111 and 1010 process control systems. The exhibition, from October 6 to 12 and Taylor Instruments MOD 111 configuration included a console, a 1010 computer system, a line printer and a colour VDU.

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The Crunch for a phone phreak

"DO you know what a blanket party is? A blanket party is when you're jogging down the track in the prison yard and they throw a blanket over your head and they beat you, maybe to death — with clubs."

That is what John Draper learned in jail. What his fellow inmates learned from him is not clear, but they could have got an inside track on just how to rob the telephone system.

That is why Draper spent several months in the Federal minimum security prison at Lompoc, California, fraud by wire, Title 18, Section 1343, of the United States criminal code. His crime involved the use of an electronic device commonly called a blue box to defeat the telephone system's billing apparatus.

What, if anything, Draper told the threatening and inquisitive inmates, including "three people who were ex-engineers," hardly matters.

The methods of the phone phreaks, as the people who like to beat the telephone system are called, are common enough knowledge. Thousands in the US are believed to be defrauding telephone companies, and only a handful are ever caught.

Some of the phone phreaks believe they are helping to destroy a pernicious Establishment, epitomised by the American Telephone and Telegraph Company.

TAP, a newsletter published by and for these technological guerrillas, affects a leftist-anarchist style. It has been available for \$5 per year simply by writing to Room 418, 152 West 42nd Street, New York, New York 10036.

While Draper is neither a hardened criminal nor a wild-eyed revolutionary, he did achieve quite a bit of notoriety under the name Captain Crunch.

Captain Crunch is a brand of caramel popcorn that once offered a free whistle in each box of candy. That whistle emitted a 2,800 Hz tone, coincidentally a signalling frequency used by AT&T's equipment.

A caller using certain long distance circuits could blow a Captain Crunch whistle and then pipe a sequence of other audio tones into the mouthpiece of any telephone to obtain a free call. John Draper has been credited with discovering the unusual properties of that tiny plastic whistle, hence his nom-de-guerre.

Of late, the US government has become very concerned about the activities of people like John Draper.

In addition to the public telephone network, phone phreaks have reportedly explored the separate but interconnected systems of the military, government agencies, and law enforcement authorities. All these systems are connected to computers.

Telephone access to computers by unauthorised persons jeopardises the security of criminal records systems, military personnel files and the dossiers kept by credit reporting agencies. Not only can a phone phreak gain remote access to such sensitive material; he can do so without leaving any trace of his clandestine activities.

"Phone phreaks" gear defeat the records left in the telephone system's billing apparatus," explained SRI International's computer crime expert, Donn Parker. These billing records may serve as the basis of other criminal charges, for example conspiracy.

A study of the US government's attempts to halt organised crime notes that of all the various charges filed against persons arrested by its special organised crime task forces, conspiracy was by far the most common. Thus the Mafia has a special interest in learning the methods of the phone phreaks.

In addition, Parker pointed out that other criminals have also succumbed to justice as a result of their telephone crimes while remaining immune from prosecution for other misdeeds. "Bernie Cornfield," says Parker, "might not be in jail today if he hadn't broken the law with a blue box." Cornfield for years ran the scandal-ridden financial organisation, Investors Overseas Services.

But Draper is not a hardened criminal. Both Parker, who has interviewed him, and Draper's attorney, Daniel Brookman of Los Angeles, have characterised Draper as rather simple and naive, despite his wizardry where telephones are concerned. In many ways, according to Brookman, Draper is typical of the phone phreaks.

Most are young, including many engineering students, and nearly all are far removed from the underworld. They attack the telephone system more for the challenge than for personal gain, according to a former university instructor.

Germans launch a micro

GERMANY's only surviving general-purpose minicomputer, Dietz, has introduced a micro-computer code-compatible with the rest of its 621 line.

Called the Micro-621, the new machine has a processor built up from 2901 bit-slice micros, offered by AMD and Motorola, together with a programmable read-only memory which amu-

LETTER FROM AMERICA

By Hesh Wiener

Brookman has had a great deal of experience with such persons, and actually has built up a significant practice in this unusual speciality.

He began this phase of his career when a friend was arrested for using a blue box in 1972. Brookman's defence was successful, and it led to his getting a number of clients with similar difficulties.

AT&T is reportedly devising ways of catching the phone phreaks these days, and that would help explain Brookman's observation that incidence of this crime peaked in 1974 or 1975.

The attorney believes that the legal tactics used to prosecute some phone phreaks are unconstitutional. The warrants used to obtain telephone records in attempts to establish a pattern of suspicious calls are, in his opinion, too vague and general.

Brookman may feel that Draper, who served the army of phone phreaks as an anti-hero for a short while, is not a major criminal, but there are indications that the Federal Bureau of Investigation may feel otherwise.

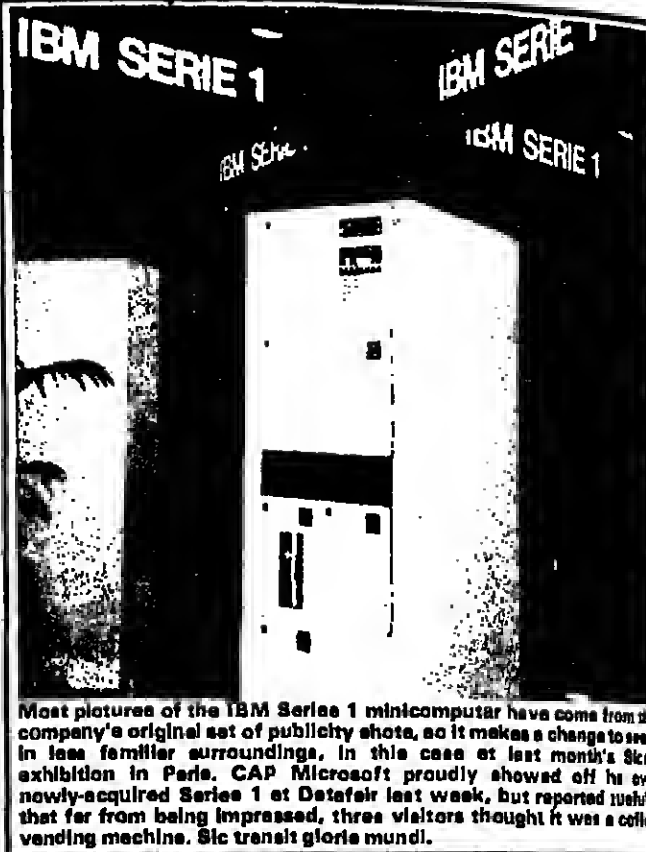
A man who goes by the name of Chic Eder has reportedly befriended Draper. According to a source in the counterculture press, Chic Eder was a companion of the late comedian Lenny Bruce and may have been a paid informant involved in Bruce's arrest on narcotics charges.

Draper might not be the object of an FBI investigation, but instead could be used as a pawn in some game to trap narcotics dealers or other criminals.

Draper, according to this hypothesis, could get caught in the trap, an unfortunate casualty, while Chic Eder bargains his way out by testifying for the prosecution.

For now, though, Draper is using his keen mind for beneficial purposes. He has designed a communications system for the personal computers made by California's Apple Computer Company.

That system will enable hobbyists to build networks of inexpensive computers and thereby exchange programs electronically or engage in long-distance computer tournaments.



Most pictures of the IBM Series 1 minicomputer have come from the company's original set of publicity shots, so it makes a change to see it in less familiar surroundings. In this case at last month's Sicob exhibition in Paris, CAP Microsoft proudly showed off its own newly-acquired Series 1 at Datafair last week, but reported truthfully that far from being impressed, three visitors thought it was a coffee vending machine. Sic transit gloria mundi.

Systems house wins first big overseas order

SYSTEMS house Toltec Data, of Cambridge, has received its first large overseas order, for a disc unit and software to enhance a microprocessor-based data collection system at the Max Planck medical research Institute in Heidelberg, West Germany.

The Institute's system, based on a Computer Automation Alpha LSI-2 processor, takes data from analytical instruments and performs some pre-processing on it before putting it on magnetic tape for further mainframe processing.

Toltec has supplied one of its own packaged twin floppy disc subsystems for attachment to the LSI-2. At the same time, Toltec has sold a copy of the

Air reservations agreement

WITH Ironair's 370/158 based reservations system (CWI, July 3, 1975), due to go live in November in Tehran, the Royal Dutch Airline, KLM, which has been helping Ironair with its implementation, has just signed a similar agreement with Pakistan International Airlines, PIA.

Like Iranair, PIA will run KLM's Computerised Reservations Royal Dutch Airline, Cordu, system but unlike Iranair PIA will not use Cordu on KLM's

own IBM 370/158 system at Amsterdam in Holland before its own system goes live. The should happen in mid-1978.

Another national airline, Yugoslavski Aerotransport, JAT, of Yugoslavia has signed an agreement with KLM to use Cordu on the Amsterdam system. JAT offices in most major Yugoslavian cities and 15 international JAT offices will be equipped with terminals linked to Amsterdam.

ON SHOW AT SYSTEMS '77



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Jim Palmer's camera eye-view of some of the latest products at Sicob

CII-HB policy for Level 6/30 and 6/40 minis

BIG news from CII-Honeywell Bull at Sicob in Paris was that the company is to build the Level 6/30 and 6/40 minicomputers at its Angers factory and sell them into the OEM market.

The company's attractive stand was laid out as a "company village" with applications for the bank, the Post Office, the Mayor's office and so forth. The three young ladies, pictured right, wearing the very fetching cheesecloth dresses chosen by the French company this year, were located in the Syndicat d'Initiative booth.

The French government has just announced its provisions for support of CII-Honeywell Bull in the 1978 budget. The total sum being set aside is 500 million francs (284 million). This is broken down into 285 million francs as a direct subvention under the four-year support plan; 35 million francs as the State's contribution to a planned increase in CII-HB's share capital in 1978; 140 million francs which does not go to CII-HB but to the companies which have taken over some of the activities of the former CII.



and 60 million francs against a possible shortfall in the orders promised by the state to CII-HB.

Public sector orders fell only 4% short of the promised figure in the year to March, 1977, and the government hopes that the 60 million will not be required. The commitment is to give the

company 55% of the value of any shortfall in the planned level of public sector business.

French debut

CLAIMED by Olivetti to be the only desk-top computer of its size and capacity programmable in a high-level language, the P8040 (pictured right) made its French debut at Sicob. It sells for about £2,000, and includes a 16 column printer also used in Olivetti's calculators, a strip display for operator guidance, and a 3 in diameter 3 K-byte disc for data storage and program entry, and is programmed in mini-Basic. Packages are available for civil engineering and statistics.



Datsaab accent on comfort

ONE of the most notable features of the new Datsaab 18/30 workstation-oriented business system is the specially-designed display terminal, shown below.



Commodore's PET



This is Commodore's PET. And in case anyone gets the wrong idea, PET stands for Personal Electronic Transactor. The desk-top machine is designed for the domestic market, and for professional people who want an accounting system as well as something on which to play computer games. Based on the MOS Technology 6502 micro and programmed in the Moon, the PET was set up to test Sicob visitors' skills in handling a module on Commodore hopes to sell it for about £800 when European marketing starts next year.

Cornerstone of the Mael line

IN previous years, Insel of Italy has exhibited at Sicob under the name of a distributor, Cigec, but this year the company showed its Mael 1000, 2000 and 4000 systems under its own name.

The company now plans to set up its own subsidiary, which will market the product line in the Paris area, but it is looking for distributors interested in selling in the French regions.

Cornerstone of the Mael product line is the Mael 2000, seen here with Sergio Rocco, one of its principal designers. The powerful business system is at present based on the Fairchild F8 micro.

"It is not a microprogrammed machine, and we don't want to be tied to one micro," says Signor Rocco. "The F8 is a 2 microsecond cycle device, and we are planning to switch to a 500 nanosecond 18-bit micro, but we have not yet decided which it will be."

Insel uses a proprietary macro language which is



interpreted rather than compiled, and the interpreter takes 16K-bytes of memory, leaving 48K-bytes for the user.

There is an assembler with a control source generator program, and facilities include a sort language, an index sequential package and the ability to use formats of any length.

"You can move 4K-bytes in one macro-instruction," commented Rocco.

A useful facility is the 1K diagnostic program, which is supplied to the user on floppy disc, so that he can check out his own machine.

The 2000 processor, also used on the 1000 key-to-floppy disc system, is being developed to cover the power of the larger but older Mael 4000, and data format compatibility will be retained.

Double-density double-sided floppy discs will be introduced on the 2000 next year, and software is organised in the same way on both floppy and hard discs.

Insel did 3,500 million lire worth of business (about £2.3 million) last year, and hopes to double it this year. About 70% of its business is outside Italy, with Germany the largest market and the UK second through its agreement with Computer Ancillaries. It is active in Holland and looking to do business with the Portuguese government.

A major project is under way with Bank Mellat Iran to design back-office banking systems based on the Mael 4000. The contract was won in competition with IBM, NCR, Burroughs and Honeywell.

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April 1978

MARKETVIEW

"BROTHERS. The invention of the printing press threatens to put the art of manuscript reproduction back 500 years. Have you seen any books produced by Herr Gutenberg? They are the ugliest things given to any one to read since the depths of the dark ages after the Frankish

invasions. Dull black and white print, unrelieved by the slightest illumination, an offence to the human spirit." If any friar made such a speech five centuries ago — and there were probably several up and down Europe — he would have had a point. Printing has taken most

of the art and joy out of manuscript reproduction. Yet who, today, would be prepared to get up and say that the invention of the printing press had been a bad thing? Take away the advertising, the pornography, the cheap sensationalism, that between

them represent a large part of what comes off the world's printing presses these days, and you are still left with a greater output of the world's greatest literature, a greater dissemination of art and scientific knowledge than could ever have been dreamed of in the days of hand

SUPPORTERS of Professor Dijkstra's micro attack now disclaim any intention of halting progress, and claim only to be concerned at poor microprocessor design.

The arguments currently expressed against the poor design of micros would be more convincing if the academic attack on microprocessor design had occurred when these defects were most glaring: five years ago. For microprocessors have not been with us for almost ten years, developed originally for the microminiaturised computers required on NASA's lunar landing module. They began to appear on the civilian DP market around 1968, but at first only to special order from large mainframe, minicomputer, and intelligent terminal manufacturers.

LSI component manufacturing techniques feature negligible unit production costs, but very high mask design and tooling up costs. So it is only on very long runs that any LSI component can be produced cheaply. If LSI microprocessors had continued to be manufactured only to special order, only the largest manufacturers could have afforded them, and the tendency of the computer industry to be dominated by an ever smaller number of larger suppliers would have been reinforced.

The first manufacturer to try to base a challenge to the computer industry's establishment on mass production of a cheap LSI microprocessor-based distributed processing terminal was Viatron in 1969. But Viatron was before its time, had underestimated the lead time before any LSI mask starts producing

QUOTE

What has happened in the last 12 months to disturb professors of computing and DP managers that had not been even truer at any time in the previous five years? Only one thing: the advent of the microprocessor-based \$200 DIY computer kit, and the \$600 fully programmable and packaged personal computer during 1976.

satisfactory yields, and was hit by a cash flow crisis just when US capital for speculative computer ventures was drying up in the 1970-1971 recession.

Thereafter, LSI microprocessor based terminal and other processors would have remained the privilege of the largest manufacturers if Intel had not led other LSI component manufacturers in designing general purpose LSI microprocessors that could achieve the economies of very long runs, and yet be sold at moderate cost to large numbers of different manufacturers and systems houses of all sizes in not too large quantities.

Intel, Motorola, National Semiconductor and all the other microprocessor manufacturers are primarily LSI component manufacturers with electronic rather than computer expertise. Inevitably it was their primarily electronics-oriented designers who designed the first general-purpose, as distinct from special order, microprocessors. Their first designs certainly showed these limitations, notably the 4-bit word Intel 4004 of 1971 used mainly in pocket calculators, and the 8-bit word Intel 8008 that appeared on the market in July 1972 and was the first to make an impact on the EDP industry.

As 8-bit parallel processing

Why academics are only now attacking micros

was all that could be integrated on a single chip at the time, and multivendor instructions were at first regarded as too complicated to design. The 8008 order code was entirely based on single-word 8-bit instructions. In these, no more than three bits could be spread for operand addresses, allowing no more than 8 registers of 8 bits to be addressed.

Larger main memories had to be addressed indirectly via addresses stored in two chained H (high order) and L (low order) address registers. But what do you do when an interrupt occurs and you want to preserve the current contents of all registers in main memory backup locations? How do you address those backup locations, without thereby corrupting the existing contents of the H and L registers?

All this, however, was five years ago. And it took less than nine months for a small French systems house, R2E, to discover a way around the Intel 8008 register preservation problem: connect a pushdown attack buffer to one of the eight I/O channels, and preserve the contents of all eight registers (including the H and L registers) on interrupt by a sequence of eight OUT instructions. Fifteenth months after that, in July, 1974, Intel itself announced the 8080 microprocessor with a much enriched order code, that includes many two and three word instructions with 16-bit address fields that allow up to 64K bytes to be addressed directly by the relevant instructions: as many as on the original IBM 360/30, four times more than on the erstwhile IBM 1401 that had been the workhorse of the EDP world as little as ten years previously.

Maybe the Intel 8080's order code, and that of the competing Motorola M6800 and Zilog Z-80, are still not ideal for the compilation of high-level languages. But then, neither are the IBM 370 and DEC PDP-11 order codes. Nonetheless the Intel 8080 has almost from the beginning been programmable in a PL/I subset, albeit via an IBM 370 cross-compiler, and large configurations now support also a resident Basic interpreter.

Maybe Basic is not the best high-level language on which to standardise, but its widespread adoption cannot be laid at the door of micros.

Nor are microprocessors standing still in the range of high-level languages that they offer. CAP-Microsoft has developed the portable Micro-Cobol compiler for all and any micros, as well as the Micro-ADE debugging package. Other languages will doubtless follow.

So with general purpose LSI microprocessors available on the civilian DP market for the last five years, and most of the deficiencies of the earlier designs corrected as long as three years ago, why are academics attacking microprocessors only now?

What has happened in the last 12 months to disturb professors of computing and DP managers, that had not already been even truer at any time in the previous five years? Only one thing: the

advent of the microprocessor-based \$200 DIY computer kit and the \$600 fully programmable and packaged personal computer during 1976.

Until then, the ever cheaper LSI microprocessors had been bought mainly by manufacturers of traditional computer equipment. They had allowed a growing number of small terminal manufacturers and systems houses to undermine the domination of the DP market by

IBM and other large mainframe manufacturers, but their products were still aimed primarily at the DP professional. With the DIY computer kit and the \$600 personal computer, we face a completely different product: one that bypasses the DP professional to appeal directly to the layman. So one is driven to the conclusion that it is this appeal to non-DP laymen by a specific application of microprocessors, rather than any

long standing but diminishing deficiencies in their order codes and software debugging tools, that are the real targets for Professor Dijkstra's attack and the response it has elicited among so many DP professionals.

Even so, it is not first sight difficult to see why the activities of hobby programmers should be regarded as a threat to DP professionals. Walking around the Personal Computing Fair at



Fred Lamond
last June's NCC in Dallas, it seemed that no more than one DIY computer user in ten had apparently moved beyond goni-playing applications to program a common-or-garden
● Turn to Page 31



The international sign for desk-top computing

All over the world Hewlett-Packard desk-top computing systems are saving time, trouble and expense for tens of thousands of scientists and engineers, administrators and businessmen. Proven technology, state-of-the-art N-MOS and LSI techniques, simplified interfacing, and systems and software know-how, add up to cost-effective performance, complete flexibility and reliability.

The promise of a better informed democracy

I SUSPECT that behind all the overt concern for protecting the innocent from DIY fools lies a deeper and far more rational fear: that the personal computer is about to invade the large corporation's head office, and destroy once and for all the DP department's control over its users' computing activities.

The centralised DP department's position had already begun to be undermined before the advent of the microprocessor-based personal computer by distributed mini-computers.

The number of dedicated applications implemented on minis has grown faster in the last five years, even in large corporate headquarters, than the number of applications on central mainframes. That is why the business minicomputer market is booming, whereas the medium size DP mainframe

living out of being among the few who could read and write. It deprived monetarism of much of their social usefulness, and thus led to their abolition in Northern European countries a century later. But they survived elsewhere, and made up for the drying up of demand for their

manuscripts by greatly expanding their teaching side, for which printing had produced a greatly increased demand. In this month's Marketview, FRED LAMOND, European editor of the Auerbach computer technology reports, explains why he believes the Gutenberg

revolution should provide a salutary lesson for the DP managers, analysts and programmers who feel threatened by the advance of microprocessor-based personal computers, and who have acclaimed Professor Dijkstra's diatribe at IFIP against the micro (CW, August 18).

professors of his standing are but tools to get the work done. If cheaper hardware tools have now become available that make some of an earlier generation's software tools less relevant, does this matter as long as the practical jobs for which computers are employed get done more efficiently and more cheaply than ever before?

Whatever happens in the future to Professor Dijkstra's standards, there are in any case two respects in which the advent of the microprocessor-based personal computer are quite unmix blessings. Both stem from the fact that they will spread knowledge and experience of programming logic and methods much more widely throughout the community.

The first is that they will help overcome the bottleneck in software skills that is generally acknowledged to be the greatest brake on the more widespread use of computers, notably in industry. Among the growing number of computer buffs who will acquire DIY computer kits or fully packaged personal computers will be many engineers and workers in non-automated industries.

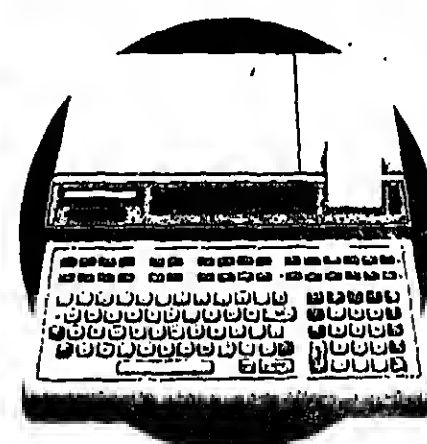
Once they have mastered computer programming techniques, their thoughts will turn naturally to their application in their own industries that they know well. The 1980s may thus see a much swifter advance in automating dull and repetitive unskilled jobs than has happened hitherto: not just because the processors and their memories are becoming ever cheaper, but because their application to each problem will come increasingly from within each industry itself, instead of being promoted primarily by computer salesmen and systems houses.

The other aspect is the much wider access to social, economic and scientific databases that a more widespread knowledge of computer programming and manipulation techniques will allow. Knowledge is power. The more the knowledge contained in computerised databases is accessible to the widest range of people, the more informed our democracies will be, and the safer everyone's freedom will be.

The abolition of drudgery and a better informed democracy than ever before. That is the promise of microprocessors and the personal computers based on them over the next ten years. How could that be a leap back 25 years?



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Academics' attack

From Page 30

invoking and tax return package for his neighbouring stores. Does it really matter whether these hobby programs follow all Professor Dijkstra's principles of modular programming and good documentation?

If a hobbyist cannot amend his thoughts-and-crosses game program because he did not document it properly, and therefore has to start again from scratch, surely that's all part of the fun of learning.

Some DP professionals seem to worry that, like the white of their other eyes, computer hobbyists will be obliged to turn to their credit should they themselves as software consultants and offer their services to the unsuspecting of

uses. Disaster will follow all too frequently from their ill-planned, ill-executed and ill-documented endeavours, and computers and the whole computer professions will be brought into disrepute.

This does indeed happen, but it is hardly a new phenomenon. There have always been and will always be computer quacks, just as there are medical quacks, crooked solicitors, dishonest accountants. And there is a well-known method for guarding against them in any walk of life: ask a little or unknown person, or a little or unknown professional service, to refer you to a referee, and contact them, before signing any contract or paying any money in advance of delivery.

FUTUREVIEW

How relevant are the ideas of science fiction authors — that rare breed of human beings who are paid by their fellow men to write about the future — to planning and predicting the course of science and technology? How, in particular, does science fiction view the future of computers? In this special Futureview interview, psychologist and computer scientist Dr Chris Evans talks to a fellow scientist, Dr Isaac Asimov.

Asimov, described as the world's greatest SF author, has written prolifically on both science fact and fiction, and is credited with inventing the concept of robotics. In his own words, he "outlawed the old-fashioned robot stories from the pages of respectable science fiction." He was also the first writer to define rules which robots must follow when they become an integral part of our lives. These are "Asimov's Three Laws of Robotics."

EVANS: Before discussing future developments in computer technology — robots, artificial intelligence and so on — I'd like to ask how you feel about the usefulness of science fiction in a general sense. Does it have any real predictive value, or is it just superior entertainment?

ASIMOV: Well, let's look at it this way: science fiction deals with the response of human beings to changes in the level of science and technology. It is the only form of literature which routinely deals with change and which assumes that the society of the future will be different from the society of today. The

difference may be for the better or for the worse, but it will be different.

Now this is important because there is no other form of literature that deals specifically with change. In ancient times, or even in relatively recent times, when people wrote about the future there was no real notion of change. Any future society was assumed to be just like the present one.

It was only with the establishment of the Industrial Revolution in Great Britain towards the end of the 18th Century and the beginning of the 19th, that for the first time

the rate of change within a society became fast enough for an individual to observe it in his own lifetime.

And that meant the birth of a new curiosity, because until then people had not really worried about what the future would be like.

Now of course this brand new curiosity had to be fulfilled, and in order to fulfil it people tried with varying success to imagine what the future would be like. And thus science fiction was born.

Now the important thing is that the rate of change has continued to increase very

Asimov's three laws of robotics: 1.—A robot may not harm a human being or through inaction allow a human being to come to harm. 2.—A robot must obey the orders given it by human beings except when such orders would conflict with the first law. 3.—A robot must protect its own existence, except when it would conflict with the first or second laws.

How robots will develop into mankind — by Isaac Asimov

rapidly, and today we are living at a time when mankind is in a state of deep, deep trouble.

Unless we can somehow anticipate the changes to come and order our lives in such a way that we can take advantage of them for the good of man, and not allow them to work for the bad of man, we are simply not going to survive.

It's for this reason that I think that science fiction is of tremendous importance because it is the only form of literature which gets people accustomed to the inevitability of change.

By the way, I think that all futurists, or at least those who are any good at all, have at some time in their life been interested in science fiction.

I do not think it is possible that anyone can be truly interested in the future and never have been interested in science fiction.

Evans: Your own science fiction has ranged very widely over a mass of technological possibilities and a mass of exciting and frightening futures. As far as I am concerned, no doubt because of my own involvement in computer science and my passionate interest in its various possible futures, I have always been fascinated by your own computer and cybernetic stories — in particular the "I ROBOT" series. It always comes as a bit of a surprise on re-reading them to see that you wrote them way back in the very early days of computing science, at a time when only the most adventurous and uninhibited computer scientists were thinking about such things as the ethics of building robots with "personalities", or computers with intelligence.

Asimov: Yes, now you see this is an interesting point because one would think that I wrote the stories because I had some insight into computer technology and could see further than even the computer technologists themselves. Nothing could be further from the truth, because when I first started writing my Robot series, back in 1939, it was before Vannevar Bush had put up his first all-electronic computer.

I had no knowledge whatsoever of computers, and I never did have until after the war, by which time the various Robot stories and "I ROBOT" had all been written.

Actually, they came not from anything that was done in science but from the previous history of science fiction. Robots had been a staple of earlier science fiction, but they had almost always been there in the form that had started with Mary Shelley's "Frankenstein".

In this concept the robot was a monster, a soulless piece of life which had been produced by a scientist who should never have done it.

A scientist was defying God by taking over a God-like function, producing life, and was therefore fittingly punished when the robot turned against him and had to be destroyed. It's the Sorcerer's Apprentice theme all over again.

Well, I grew tired of that plot and felt that it would be interesting if I could treat robots not as examples of scientists defying the gods, but just as engineering devices which, like any other engineering devices, would have to have built-in safeguards. That was the important thing: the safeguards to prevent what I call the Frankenstein neurosis. And so after a while I crystallised these into what I called the Three Laws of Robotics.

In the very first robot story I made reference to the fact that robots were built in such a way that they could never turn on human beings: their creators

In a scene from the 20th Century Fox release "Star Wars" is C3PO (See-Threepio) one of the two extra-terrestrial robot characters.

But by the fourth story I had actually fully defined the Three Laws and they of course have been a staple of my stories ever since.

It is these three laws I think that made my robot stories different from any others, and in fact outlived the old-fashioned robot stories from the pages of respectable science fiction.

Evans: I wonder how valid the three laws will turn out to be: are computers or robots reaching the point where we will need to apply them? Could you state them in order?

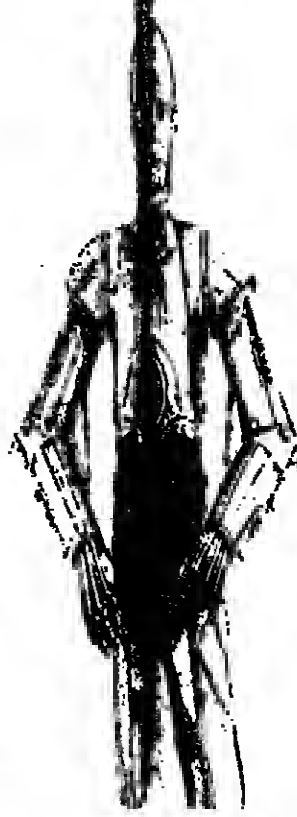
Asimov: The first is, A robot may not harm a human being or through inaction allow a human being to come to harm. The second law is that a robot must obey the orders given it by human beings, except when such orders would conflict with the first law. The third law is that a robot must protect its own existence, except where that would conflict with the first or second laws.

Evans: And the "I ROBOT" stories were really permutations of the difficulties that might arise where robots were forced into juggling with the respective merits of these laws for one reason or another.

Asimov: Yes, the laws are sufficiently ambiguous so that you can consider ways in which they might fail to cope with real-life occurrences. At the start, needless to say, I began with rather trivial difficulties or paradoxes, but as time went on I was more or less forced into a deeper philosophical consideration of what the laws actually meant.

Of course I know from the beginning that there was one particular robot on which the three laws could founder — if circumstances arose. And that was tied up with the fundamental question: what is a robot? Other words, what is this thing that a robot must obey?

How does one know for sure that a man is not a robot? And how does one know for sure that a robot is not a man?



if I am remembered in it, it may well be for having established the base for the society of that time. Because I do feel that when robots or intelligent computers actually come into existence something very much like the three laws will have to exist.

Perhaps when the three laws of robotics are established they will be known as "Asimov's Three Laws" — well it's nice to think of!

Evans: Do you feel that current developments in artificial intelligence, leading possibly to a computer which could have some bits of self-consciousness, are likely to affect man's image of himself? How will human beings react to such extraordinary developments?

Asimov: Well, I suppose man will react to them and there will be a strong effort, which may win out, not to produce computers that are rivals to man, or to destroy any that are produced.

Now I have definite views which perhaps put me in a rather tiny minority in this respect. Let's put it this way: so far evolution has come along through hit-and-miss, random processes, and perhaps once you achieve a species which is intelligent enough to guide evolution rather than be a slave to it, then the old random hit-and-miss methods are no longer efficient.

In other words, from this point on we should expect mankind to start guiding evolution, both of his own and of other species.

Well, an "artificial intelligence" is of course another species, and perhaps if we can more rapidly produce an artificial human brain, then that is the direction that evolution ought to go, regardless of our personal feelings.

It doesn't matter to us that the reptiles probably disapproved of being replaced by the mammals, or that the mammals themselves probably disapproved of having the primates take over the leadership, or that the lower primates would resent the superiority of Man. All life forms, perhaps, if they had the vote, would disapprove of mankind dominating.

Now we don't care about such disapproval. We feel that evolution ought to progress in the direction that it does, as long as we are the end-product.

Well, by the same argument, there's nothing sacred about us either and there's no reason why an intelligent computer, an artificial intelligence superior to our own, should not succeed to the "domination of the world" in the same way that we have already done. Nor would one expect him to be bothered about this or what we feel about it.

In fact, considering what we — men — are doing to the world right now, my own feeling is that it's a shame that we can't get the intelligent robots to take over faster than they are likely to, so that they can save the earth.

Evans: That sounds like a good theme for a cephalopod novel.

Asimov: So it does, and it puts me in mind of a story written back in 1956 called "The Last Question". It's my favorite because, of all my stories, this was the one in which I followed my imagination to its most

and to dip into the future as far as the human mind could reach.

It's really a description, in six scenes, of the next trillion years in human history, showing the parallel development of human beings and computers.

It shows how at each stage humanity makes enormous strides, from developing use of direct solar energy, to developing inter-stellar travel, to developing immortality, to developing the ability to live outside bodies, and so on.

At the same time computers become more and more ad-

vanced, more and more capable, more and more existent in hyperspace, more and more able to be everywhere in the universe.

Finally they get so intelligent and capable that all you've got to do is to ask them a question and the super-computer answers.

Now all through this history there has been this continual question arising — hence "The last question" as the title — as to whether there is any way of reversing the inevitable death of the universe; but no being,

human or computer, has ever been able to answer it.

And then at last the universe does die. All that exists is the super-computer in hyperspace and the last human souls who have somehow been made one with it. And then the computer hovers over the dead universe to decide what it can do about it, until finally it works out how to restore everything.

And the computer says, "Let there be light." And there was light.

* I ROBOT, by Isaac Asimov, 60p. Published by Panther Paperbacks.



Isaac Asimov... "How does one know for sure that a man is not a robot, or even a robot is not a man?"

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COGARVIEW UPS—a way to stay in business when others have shut

long enough to cause any real problems.

Now that everyone knows just how vulnerable power supply is even in the world's largest and most sophisticated city, it is doubtful if any line manager could look at his computer staff in the evening and say that a UPS was unjustified.

If the blackout makes a fortune for anyone it will surely make a fortune for manufacturers of uninterrupted power supply systems.

I have always been an advocate of UPS, and at the Cogarview Corporation we raised a few eyebrows by building a UPS capability into some Singer 1500 units as standard.

I thought then, and I am prepared to say I'm sure now, that we were just a little ahead of our time. In a few years, only cut-rate independents will dare to offer any major device with-

out some kind of inherent guard against loss of power.

There are really two kinds of UPS, or rather a smaller and larger version of the basic concept. The stripped-down UPS provides battery back-up for mains power and thus something around 10 to 20 minutes computing for the entire system, or be up to an hour for just essential elements of the system (there may be considerable variations here according to size), and it automatically ensures constant power supply free of fluctuations at other times.

The "tuxedo-ed" UPS does all this and one more thing: it switches on a standby generator to replace its own battery power once the 10 or 20 minute mark begins to loom if mains power still has not returned.

Of course most devices are designed with certain tolerances to voltage fluctuations.

Neither processors nor peripherals are going to crack up if there's a surge or a drop of power within a few fractions of the stipulated input.

In the UK many computers have operated without trouble even when strikes have resulted in long-term voltage reductions of up to 10%. I am told (though some VDUs began to suffer at the 6% mark).

But in the US there is a constant threat of brown-outs, and at least for the next few years the threat is likely to increase rather than diminish.

Indeed, if the environmental people get their way, volatility of power supplies could become a permanent feature of many parts of the US, just like it is in most developing countries.

In the face of this threat, it seems madness to take no more precautions than insuring your system will dump out all vulner-

able data before it switches itself off.

Unfortunately the UPS concept seems to have been misunderstood by users. It is not a way of postponing shutdown by a few minutes — though even that can assure an orderly closure of files.

Properly designed, a UPS system is a way of staying in business when everyone else has shut down — either for the full stretch of 90% or more of all power losses; or, at a little extra cost, for even two-day blackouts like that which nobody ever thought could happen until it happened in New York.

The concept has been misunderstood because the idea has got around that a worthwhile UPS is appallingly expensive. This is because the best-known UPS users to date have been airlines with huge reservations systems to protect, or time sharing services with enormous networks.

For companies like these, a UPS can cost as much as \$2,000 per kVA. CallData's 300 kVA UPS cost \$250,000 (£144,000) five inflation-ridden years ago.

But figures like this are misleading. In the first place they have to be contrasted with the possible loss of income resulting from power losses during the period of their amortisation. In the second place, the capital cost can be fairly insignificant for small users.

I would be willing to bet that there are many smug DP managers in New York today who know that their "expensive" UPS paid for itself in one burst this summer.

There are two reasons why I am so confident that the UPS concept is going to become widespread. The first is the rapid growth of data communications, which is about to enter an altogether new, enhanced phase with the launch of SBS.

Has anyone noticed that the telephones go on working when there is a power strike? Telephone companies all realised years ago that power loss could have catastrophic results, and their systems are all fully backed up by UPS.

There may be a curtailment in the number of lines available into and out of the affected area, but the network itself keeps functioning.

Exactly the same has to apply to data communications networks. Imagine, for instance, a network with a concentrator installed at one location serving, say, 40 users at different places. No network can risk loss of

power at the concentrator suddenly. The more users at stake, the less significant the capital cost of the UPS becomes.

And the other reason is that battery technology is improving all the time. It has been a painfully slow process, but it has begun.

Sealed lead-based batteries are a lot more reliable and take many more recharging cycles than old fashioned batteries. I am certain that further developments will make batteries last longer, recharge quicker, take up less space and cost significantly less so that in a few years' time no computing device will be complete without its integral UPS.

In the meantime the computer industry is going to become a happy hunting ground for UPS salesmen. Most will be of undoubted integrity, a few will not.

So some words of advice from a UPS prologist to the unwary potential user: First of all, consult a good electrical engineer before making a move. Secondly, assign a cash value to downtime — easier for some than for others. When you are working out this value, try to include a notional figure for frustration, customer aggression, late completion, maybe even loss of data or of business.

Thirdly, calculate on the basis of your cash value (amortised over as many years as you reckon your UPS should last before replacement) whether you need a UPS with full systems capability, or whether you could devise an automatic shutdown of inessential parts of the system with consequently reduced needs for batteries. Then work out what sort of risk of major power loss you are prepared to take.

Are you going to gamble that few shutdowns last more than an hour? Or are you going to assume the worst, limit your UPS to five or ten minutes and have a standby generator installed instead of extra batteries? Now you are ready to start looking for hardware.

And when you do, you are in for a shock. All the salesmen will dwell heavily on the MTBF of their systems. Unfortunately, even UPS systems break down and you should ensure that your consulting engineer has worked out the need for the cost of preventive maintenance before you sign the contract. Maintenance costs rise exponentially alongside increasing battery sizes. Operating costs of a big UPS can run as high as \$20,000 (£11,450) a year.

liability greatly. This tuning requires a good ear and a great deal of patience, but it is a way for the amateur to achieve impressive voice quality using a simple computer system without incurring high cost.

Among the opportunities opened up by the development of these low-cost applications are many.

Other fields that will benefit directly are spoken word control, in which a spoken word may command machinery, medical systems, particularly those for surgeons whose hands are occupied, and data entry systems, where a computer can be used in conjunction with a telephone for processing.

Computers that talk and listen

● From Page 16

tables that have greater fidelity than those developed by simply applying phonetic rules to the spoken words. The results of the expensive process include phonetic data, pitch information and a description of phrasing that is analogous to a musical score.

In commercial applications the development of an easily-understood vocabulary for a synthesiser will be an important part of any software project. For hobbyists, whose needs may be met by less refined electronic voices, the economical synthesis-by-rule approach will be the most common method.

With practice, a programmer can modify the data drawn from phonetic rules to improve intelligibility.

defensive move against possible nationalisation of CIT. Honeywell-Bull in France is planning to extend

the French Socialist Party has announced that it intends to nationalise the country's only mainframe manufacturer, CII-Honeywell Bull. If the "Left Alliance" wins the next General Election next March, its main partner in the Alliance, the Communist Party, has only proposed nationalisation of Compagnie des Machines Bull, which holds 63% of the CII-HB equity. (CW, September 22.)

THE biggest boost to date for the interactive language Mumps was received last week, with the announcement that specifications for an ANSI standard for the language have been accepted by ANSI's DP committee. X3. The Mumps ANSI standard was first completed almost a year ago. (CW, September 23, 1976). Final approval gives this relatively new, user-developed language a status so far achieved only by the "industry standard" languages such as Cobol, Fortran and Basic. (CW, September 22.)

IN what is seen, in part, as a

ROUNDUP

THE latest contender for a share of the potentially enormous market for electronic office equipment is the worldwide oil corporation, Exxon, which is now to introduce a low-cost text editor to compete directly with IBM's memory typewriters.

Exxon, better known in Europe as Esso, is also weighing in against Xerox and AT&T, the US telecommunications giant, for a share of this market. The text editor, called QYX, is being built by Quix of Louisville, Pennsylvania, a firm set up by Exxon Enterprises, a venture capital organisation established by Exxon as part of its long-term diversification plans. (CW, September 29.)

THE top three executives for Esso, the National Enterprise Board's computer services company have been appointed. John Pava, who was NEB deputy general director of computers and electronics, has become its full-time managing director. Tony Chandler becomes Esso's director of business development responsible for all new business ventures outside the UK, and Seymour Joffe becomes the head of Esso's US operations as president of Insc Inc. (CW, September 15.)

GOVERNMENT officials responsible for university computing in Austria, Belgium, Denmark, West Germany, Ireland and the UK met at Bath University for the first Conference of European Computer Scientists. The conference discussed matters of common interest and looked at the possibilities of international university collaboration. (CW, September 15.)

THE French Socialist Party has announced that it intends to nationalise the country's only mainframe manufacturer, CII-Honeywell Bull. If the "Left Alliance" wins the next General Election next March, its main partner in the Alliance, the Communist Party, has only proposed nationalisation of Compagnie des Machines Bull, which holds 63% of the CII-HB equity. (CW, September 22.)

THE biggest boost to date for the interactive language Mumps was received last week, with the announcement that specifications for an ANSI standard for the language have been accepted by ANSI's DP committee. X3. The Mumps ANSI standard was first completed almost a year ago. (CW, September 23, 1976). Final approval gives this relatively new, user-developed language a status so far achieved only by the "industry standard" languages such as Cobol, Fortran and Basic. (CW, September 22.)

CONTRACTS for the development of prototype compilers for the US Department of Defence's planned standard real time language have been awarded. Three of the four contracts have been awarded to US-based developers, with a nod in the direction of Europe, which effectively excludes Algol 68. UK's last candidate for a base language, Unicon, has been rejected. Implementation selected for Pascal, a highly structured Algol-related language, developed by Niklaus Wirth of Zurich, on the basis of work in collaboration with the UK's Professor Tony Hoare. (CW, September 28.)

IN what is seen, in part, as a

Exxon joins the battle of the giants with QYX

the power of the Level 6 minicomputer line to match most of the French-built Level 61 series. (CW, September 29.)

AS a follow-up to its Fortran-oriented "supercomputer", the Scientific Processor (CW, April 14), Burroughs has developed a modified version with a reduced, but still impressive, Fortran performance, aimed at a wider market. Known as the Attached Fortran Processor, AFP, it is like the Burroughs Scientific Processor, designed to work as a "back end" to a general-purpose Burroughs machine and can be attached to the B6700, B6800, 7700 or 7800. (CW, September 29.)

WITH the aim of gaining a foothold in its competitors' big customer sites in Europe, Honeywell has launched the Page Printing System, PPS, which runs at up to 18,000 lpm and operates offline, accepting magnetic tapes from any type of mainframe. The PPS has been test marketed in the US for two years and was officially launched earlier this year at the National Computer Conference in Dallas. (CW, June 23). (CW, September 29.)

Zooming up TV sports

"The most significant TV development for sports coverage since slow motion replay machines were introduced," was how American Broadcasting Corp production staff described a technique produced by British know-how. Using the DAE 5000 developed by David, of Catlin, Surrey, ABC established a world "first" in television broadcasting on September 15. Used during the broadcast of the finals of the World Series Baseball, viewers were shown a computer controlled zoomed-up version of several incidents. This version captured the incident in detail, no matter how insignificant or small it appears in the original shot. (CW, September 29.)

A FURTHER addition to the Phillips line of workstation-oriented business computers has been announced in Germany. Called the P430, it will slot between the P420, announced last year, and the P440, launched at Hannover in April, 1977. (CW, September 28.)

FORMAL agreement has been reached between ICL and the South-West Universities Regional Computing Centre, on the development of an Algol 68 compiler for the ICL 2800 series. The compiler is scheduled for release in October next year, and will be part of ICL's standard product range. (CW, September 28.)

ONE of the most successful independent teleprocessing monitors for ICL machines, Telecomputing's TFS, has been taken up by ICL for marketing in the UK and Europe. The puts users in these countries on a par with those outside Europe, to whom ICL has been supplying TFS for almost a year. (CW, November 4, 1976). This agreement gives Telecomputing a world rights to supply TFS for use on ICL's 2800 and 2900 machines and on the ICL 2800 series running under DMS. (CW, September 28.)

A summary of main news items which have appeared since the last issue of Computer Weekly International on September 8.

only to receivers also capable of taking ordinary television signals or to commercially-available Viewdata-only terminals planned by companies like GEC and IIT. (CW, October 6.)

AN international reciprocal agreement concluded last week should ensure wider marketing opportunities and better support in Europe for two popular teleprocessing monitors, Westinghouse's Estl, for IBM machines, and Zeus-Hermes' Cortex, on ICL equipment. Westinghouse has taken marketing rights for Cortex in Europe and Zeus-Hermes has undertaken to provide implementation support for prospective Westl users in the UK. (CW, October 6.)

A COMPLETE range of peripherals for IBM Series 1 minicomputers is to be introduced by Control Data within the next two months. The range will include matrix and line printers, a video terminal, disc drives and add-on memories. (CW, October 6.)

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Irish air traffic control link

THE Irish end of Eurocontrol, the international body which handles air traffic control over much of Europe above 25,000 feet, has called in Cara Data Processing of Dublin to install Racal-Milgo modems and switching equipment to link a radar station at Mount Gabriel in the extreme west of Ireland with the Eurocontrol centre at Shannon, and the Civil Aviation Authority's centre at West Drayton, Middlesex.

The installation in Shannon consists of two CII Iris 45 mainframes.

Saudi Arabian contract

SAUDI Arabia is now the biggest market after the UK for business forms specialist PFC (Business Forms) of Cradley Heath, near Birmingham. The latest contract is from the Saudi Arabian government which has ordered optical mark recognition forms for two university research departments. The forms will be printed in Arabic and English and the company says the fact that it has Arabic speakers on its UK staff is one reason for its success in Saudi Arabia over the last 18 months.

NBI to expand

EXPANSION of word processing marketing into Western Europe and the Far East has been announced by NBI, of Boulder, Colorado.

NBI currently markets its software-based range of word processing equipment solely in the US.

COMPUTER WEEKLY INTERNATIONAL

Adding a sporting touch to negotiations

FOUNDED by a former computer salesman, Joseph Auer, International Computer Negotiations provides users with negotiating — not legal — advice, runs seminars for the people who are involved in the purchase of computers and publishes a remarkable newsletter, CNReport.

The firm is also noteworthy for its resistance to the pressures of big-city business and makes its home in Winter Park, Florida, a town of 22,000 near the middle of that peninsula state (47 miles) due west of the Kennedy Space Centre and a stone's throw from the Disney World amusement park.

Auer believes that computer contract negotiations should be more sporting, and in fact he is a sportsman himself. Before founding ICN in May, 1975, he was a professional footballer for five years, with the Buffalo (New York) Bills, Miami (Florida) Dolphins and Atlanta (Georgia) Falcons.

It was in Atlanta that Auer first worked in the computer business as an employee of Management Science America, MSA, the software company. Honeywell was his second — and last — employer on the selling side of the business.

Hesh Wiener reports from New York

Joe Auer's abilities in both sports and computers compelled him to try his hand at the underdog's side of the business. And that is how International Computer Negotiations came into being.

ICN's advantage is an insider's knowledge of the areas in which vendors can give in on price and service. As business has grown, ICN added to its Honeywell expertise by hiring former employees of IBM, Burroughs, Univac and even the US Justice Department, which lost a member of its IBM anti-trust staff to ICN's sister negotiating team.

The firm's experts don't come cheap, but they believe their advice is one of the few bargains in the computer business. For a fee that runs about \$1,000 per day, ICN will supply an appropriate bargaining adviser.

The firm claims that its clients save about \$100,000 on a typical purchase or lease worth \$1,000,000, and they do it without having an ICN expert coach them for 100 days.

As ICN's business grew, another need became

apparent to Auer, the need for basic knowledge. Last spring ICN launched CNReport, its monthly newsletter. It has garnered hundreds of subscribers, and not all of them are computer buyers. Among the readers of CNReport are nearly all the US mainframe vendors, plus the big names in minicomputers and leasing.

Helping with the publication are well-known contract advisers, including Dick Brandon.

ICN's other venture is a series of seminars that will make the firm truly international. Based on a successful US programme, ICN's European lecture tour will begin in London next April, Brussels and Stockholm will follow.

Where does all this leave Joe Auer, former football player and reformed computer salesman? Will he quit when he has made his first hundred million and buy a professional football franchise? "No way," he says, now the complete businessman. "I'll buy myself a losing company."

CNReport, ICN, Box 384, Winter Park, Florida, 32780, USA. \$195 per year plus \$25 for airmail to Europe (above £25 from UK).

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Siemens version of Easytrieve package

ANOTHER software company which made its name in the IBM market has acknowledged with a product development effort of Siemens in the West German user community. Pansophic Systems, of Illinois, has produced a Siemens version of its Easytrieve information retrieval package.

Until now Pansophic's products have been entirely oriented to the IBM 360 and 370 series, apart from early versions for the RCA Spectra 70.

The new Easytrieve will run on Siemens' 4000 series under the BS1000 and BS2000 operating systems.

The 4000 architecture has close affinities with that of the Spectra 70 and also with the ICL System 4 — a point which could prove of interest to the UK market. The Siemens operating systems bore some similarities to IBM software, easing the conversion task.

Pansophic acknowledged that the large number of Siemens users in Germany was the main motive for developing the new version. Other previously IBM-dedicated software companies have perceived this need, notably the UK's Altergo.

Pansophic could not comment on any plans to transfer their other products — the Panvital library system and the Panda disc space analyser — to Siemens equipment; nor could the company say if any other hardware was being investigated with a view to conversions.

Siemens Easytrieve has already been installed at test installations in Germany and Scandinavia, said Pansophic.

Telex double

ITALY has been added to the list of countries where Telex sells the Lockheed System III as a replacement for IBM's System 3 and a competitor for System 32 and 34.

Telex has so far installed 38 System III's in Europe, 14 of them in France, and is looking for sales of 100 Europe-wide by next March. In most countries, Telex sells to existing IBM users, but in Ireland the system is being sold in competition with System 34 and has already scored two victories.

An enhanced operating system and a database system are under development at Lockheed, which will enable the System III to support use of eight Calcomp T200 200 Megabyte disc drives. A multiplexer to support 32 terminals is also on the way.



Numerical control is becoming big business for Siemens, which has now sold almost 8,000 systems since it started in this area. The company is aiming at another 1,500 sales worldwide this year, which will mean a revenue of about DM80 million. Extensive use is now made of microcomputer technology in equipment such as the Sinumatic System 7, seen here being manufactured at the company's Erlangen plant. More than 180 of these and other NC systems from Siemens were on show at the European Machine Tool Exhibition in Hannover last month.

Philips approaches to IBM and Univac

FACED with the long-term need for a successor to the Philips P1000 machines in Philips' own factories in Breda, Holland, the company has made preliminary approaches to Univac and IBM.

With the collapse of the Uni-data venture (CW, September 11, 1975), Philips pulled out of the mainframe business and concentrated on smaller machines. The company now P1000s are likely to remain in

use until 1980, said a spokesman. The chief criterion for a replacement for after that date will be the availability of compatible software on the machine selected, he added. The selection of a machine will not immediately bring a recommendation for appropriate conversion by the P1000 users outside Philips. Such a recommendation could, however, be made by the company's time, said the spokesman.

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- * familiarity with IBM DOS/VS Internals.
- * senior software developers — 5 years' recent IBM DOS or DOS/VS involvement and good supervisory experience.
- * software developers — at least 2 years' recent DOS or DOS/VS experience.

Ref. No. 824.

P.S. We are always interested in hearing from experienced Computing Staff who wish to work overseas. We are in touch with companies in many countries, so if you are interested in working overseas then contact Gordon Cairns now.



**JOHN
GOLDSMITH**
(Computer Recruitment) Ltd

15 Buckingham Palace Road, London SW1 0PP
Telephone: 01-828 5356

CONFIDENTIAL

Il y a une application: les auteurs du volume y
font référence, mais ils ne publient pas eux-mêmes.

Applicant

PLEASE COMPLETE IN BLACK INK

Surname	
First Name	
Address	
Home Telephone Number	
Business Telephone Number	
Personal e-mail	
E-mail account	
Present salary	
Salary requested	
Date of birth	
Period of notice required	Married-Single

Education

Simbol	From	To	Particularities pointed
Quemadmodum fuerit etiam aliter	From	To	Comments taken and to all
Other quality denote.	From	To	Comments taken and to all

Empirical Performance Analysis

[illegible]

Technical Experience

Please state duration of experience in each section below, with more precise details in 'Additional Information'

```
Operating  
Systems  
IBM Tivoli  
NIMVS  
IBM MF1  
IBM MV1  
IBM VS1  
IBM VSP  
IBM VM  
ICL GEORGE 1  
ICL GEORGE 2  
ICL GEORGE 3  
SVC A LEVEL  
DEC R  
GOVS  
OS/2000  
OTHER  
Fac Management  
  
DBMS  
DBOMI  
CLASS  
PLS -  
PA  
R/C
```

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TOTAL  
NIMM4  
CLIMS  
OTHER  
Comments about  
  
CRS-  
TEAM  
NTAM  
VTAM  
DRIVER(S)900)  
DRIVER(S)4)  
TASKMASTER  
CHURRON  
OTHER  
  
TABN  
DMS  
FINO II,  
MARK IV  
DL/I  
OTHER
```

Managerial Experience

Computer languages: affected

Foreign languages: spoken

Combination of both

Any specific disabilities?

Hobbies

Do you have a current driving license? Are you a car owner?

Are you a first-time voter? Are you prepared to relocate?

Are you prepared to travel during the course of your work? Daily? Longer periods?

Please list geographical areas where you are open to being

ADDITIONAL INFORMATION

Please provide any details which you feel are relevant to your application and have not been covered. Also you may care to give some information of the particular aspects of the job applied for, for which you feel particularly qualified.

Please attach additional sheets as necessary.

JOHN GOLDSMITH (Computer Recruitment) Ltd.

John Goldsmith (Company) Limited, 15 Buckingham Palace Road, London SW1. Telephone 01-275 1511. 24 hour answering service.

OPPORTUNITIES IN GERMANY CHARTERPORT

We represent a major German consultant who seeks top personnel. Several openings exist for highly skilled and motivated people with a positive and creative attitude.

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SYSTEMS ANALYSTS

SYSTEMS PROGRAMMERS

APPLICATION PROGRAMMERS

Knowledge and experience is looked for in the following fields:

Systems Software of IBM and/or English Electric, DB/DC-Systems, first rate knowledge of at least two of the following languages: COBOL/RPG/PL-1/Ass, at least one of the operating systems OS/DOS/4J, familiarity with modern design techniques, experience with the management and implementation of large projects, experience with commercial applications and standard packages.

Education: Academic degrees are welcome, but professional skills and experience are essential.

Advancement to project management and management jobs will be offered to suitably qualified people after a period of resettlement in Cologne or Munich. A knowledge of German is preferred but candidates willing to learn the language will be considered.

Salary £9,000-£15,000

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ANALYSTS & PROGRAMMERS

We've come a long way since then.

Wondrous though the business seemed in 1922, when the BBC first began radio broadcasts, our industry was of course, in its infancy. But progress has been rapid. Today, we have a dynamic, technological and creative corporation, evidence of which can be viewed daily, in colour, on that complex piece of equipment in your living room.



Find out just how far, at our next informal interview.

And as with many other contemporary operations, the computer has come to play a major role. With the BBC Computer Unit there are wide ranging applications in television, radio, engineering and finance, and now, we need more young analysts and programmers to help us develop new TP, on-line and data base systems for our ICL 2960.

You'd be working in Central or West London, but we'd like a chance to talk with you first, on:

MONDAY, 17th OCTOBER, between 5pm-8pm at BBC, 252 Western Avenue, Acton, W3 (Gipsy Corner - nearest tube station North Acton).

We expect to meet young people of outstanding potential. And we can promise that you'll get a very clear picture of our career opportunities. (New salary increases are effective from 1st October 1977.)

If you can't make it, please write to: Appointments Department, BBC, Broadcasting House, London W1A 1AA quoting reference 77 G.497/CW3 or phone 01-743 8000, ext. 4752.



Computer Engineers New Zealand

Control Data, one of the world's leading manufacturers of IBM plug compatible equipment has a requirement for experienced Computer Engineers to join field teams in Auckland and Wellington, New Zealand.

Control Data's requirements are: Minimum of three years Customer Engineering experience, preferably on IBM 360 and 370 mainframes, magnetic tapes, printers and discs. We offer: Salaries in the range of 9,000 New Zealand dollars to 14,000 New Zealand dollars depending on experience (approx. £5,027 to £7,821). Payment of reasonable relocation costs for successful applicants and their families. Assistance with accommodation on arrival. Four weeks annual leave. Income insurance scheme. Immediate entry to superannuation scheme. Six monthly merit reviews. Final interviews will be conducted in London late October by a representative from Control Data New Zealand. You should contact Quinn Seligman 01-672 3411 for an application form or write to her at: Control Data Limited, Green Lane, Hounslow, Middlesex TW4 6BL.



CONTROL DATA

Operations Manager

North of England

Circa £8,000

An opportunity occurs for a young, dedicated and truly professional DP person to join a dynamic, progressive management team, controlling a very large mainframe site.

The incumbent, aged 25 to 35, must offer a strong operations background (preferably based on ICL equipment), energy, enthusiasm and proven men management capabilities with ability to motivate and control over 50 staff, including union members requiring negotiating diplomacy.

A wide technical appreciation of hardware/software maintainability is expected within their respective environments to enable judgements to be made on advice and recommendations from experts. He/she will be able to distil from detailed technical requirements, precise management objectives, optimising resources with regard to daily logistics. The demands of user and development departments must be met, necessitating a close and understanding relationship with supporting services.

This position requires a flexible and hard-working approach, but the potential career rewards are high. The size of the organisation provides definite possibilities in senior management. Benefits normally associated with such an opening are available, including generous assistance with relocation expenses.

Please contact: MANCHESTER office (24-hour Answerphone) for an application form or apply in writing quoting ref: CW58-7M.

01-888 8883 (24 HOUR ANSWERPHONE)
19 PARK STREET, CROYDON CR9 1TN

061-236 2419 FAULKNER HOUSE
FAULKNER STREET, MANCHESTER M1 4YD

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Or write to:

Recruitment Consultants
Ashley House
Ashley Road
Alumcham WA1 1 1TB

Data Operations Controller

London W.1. c. £4400

If you already have some experience in data preparations, control, or remote batch operations, and now feel you would like to broaden your horizons, there could be just the job for you at Total Oil Marine.

We are looking for someone to supervise our small but vital Red Lion key to disc system, used with an IBM 370/135 to provide an 'on-line' service connecting our London and Aberdeen offices.

You will ensure that all data is prepared, controlled, despatched and checked according to schedule before submission via our remote batch facility.

This is an important and responsible post for which we are prepared to provide training.

Educated to at least 'A' level standard, you should have some previous data processing experience. Equally important, you should have a flexible attitude to your work, a meticulous eye for detail, and the ability to motivate others.

In return, we offer an attractive remuneration package, including bonus, BUPA membership, lunch and travel allowances, pension/retirement facilities and four weeks holiday and the opportunity of working in modern pleasant surroundings.

If you are interested, please write or telephone: Mr. R. Newland - Head of Recruitment and Training, Total Oil Marine Limited, Berkeley Square House, Berkeley Square, London W1X Telephone 01-499 6080

TOTAL OIL MARINE

Total Oil Marine is among the principal operators in the North Sea oil and gas industry. We're the UK production and exploration subsidiary of Compagnie Française des Pétroles, one of the world's largest oil companies.

Abadan Institute of Technology, Iran

UNIVAC 1100/11

£9,000-£15,000

TAX FREE + HOUSE

Head of Software Applications Programmers

Abadan Institute of Technology have recently installed a UNIVAC 1100/11 computer and wish to form a Software and Applications section. Applications are invited from self motivated persons who should have a B.Sc., M.Sc. or Ph.D. in a scientific subject and experience with a high level language on a large computer. An opportunity will be given to the successful candidates to participate in the education of the students.

Exec. Specialist

Applications are also invited from persons having extensive experience of the UNIVAC operating system who have the ability and confidence to be responsible for all aspects of low-level software.

Applications, stating clearly which positions are being sought, should be sent directly to the: President, Abadan Institute of Technology, Abadan, Iran.

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Market Development Manager

(Mini Computer Manufacturer)

Remuneration c£12,000p.a. + car, etc.

Our Client manufactures a fine range of computer products which are accepted in both the commercial and technical markets. This key position calls for a Marketing Professional to assume full responsibility for:

- product marketing
- product specification
- promotion
- marketing intelligence
- Market planning & direction

Candidates should offer:

- a developed understanding of marketing computer based products
- sales/sales management/sales related involvement
- a feeling for the smaller Company environment

Substantial further career growth is possible to include a Board appointment within a foreseeable time-scale.

CONTACT: ADVISING CONSULTANT: PETER RIGBY on 021-236-3781

quote REF: CW/10/7

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Freepost, Equit and Law House, 35/37 Great Charles Street, Queensway, Birmingham B3 2BR



SENIOR PROGRAMMER/ANALYST

A vacancy exists in our Data Processing Department for an experienced Programmer to assist in the maintenance and development of commercial systems. The Company operates a Surveys 81715. Applicants should be at least 25 years of age, have had 3 to 4 years' commercial data processing experience — preferably using RPG II and be of a mature personality enabling them to communicate with people at all levels. The Company is highly successful in its field of operations which entails the manufacture and supply of Educational Stationery and Teaching Aids. An attractive salary is offered for the post and the Company operates a staff restaurant and a Sports and Social Club. Applications, stating age and experience to date should be addressed to:

General Manager
PHILIP & TACEY LIMITED
North Way, Andover, Hants.
Tel. Andover 61171 (0264)

HERTS., BEDS. & BUCKS. SYSTEMS ANALYST

to £6,000

Experience of financial systems design required for on-line service applications development. Travel in the U.K. will be involved.

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to £4,500

Mil based equipment servicing experience preferably on POC required for Process Control systems. Car provided.

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to £4,500

Knowledge of Assembler and micro processor programming for process control applications. UK and European travel involved.

VACANCY LIST

Free list of vacancies in Herts., Beds., Bucks. and North London areas.

Contact: Roy Drackenhurst, St. Albans 61373



BLUE ARROW 02637 50000
Blue Arrow House, 3 Holwell Hill, St. Albans, Herts.

D.P.-Oriented Word Processing Sales

c.£5K + car + bonus - target earnings c.£8K

The product combines novelty with proven worth, the market's waiting to be developed, and the company has the name and financial strength to make the most of both. We are seeking an experienced young team to spearhead sales effort for new VDU based word processing equipment. We are looking for knowledgeable marketing techniques learned during a computer-oriented career. Ideally, candidates will be late twenties, will have an educational function of at least 'A' level and will be able to show evidence of success in selling D.P. oriented office systems. They will be offered an exciting product, a London base and a remuneration package of up to £8K plus a bonus which includes a negotiable guarantee and should produce earnings c. £8K. Please write with full career details to Bill Rench.

Applications, which may be from male or female candidates, will be treated in complete confidence and should quote reference 797/WJR.

BROOK STREET EXECUTIVE RESOURCES LIMITED

17 Davies Street, London W.1Y 2LN. Telephone 01-499 7382

021-236 1170

John G. Thompson, (Inventor) Thompson Limited, 16, Buckingham Palace Road, London, W.1, England

SYSTEMS ANALYST

FLEX YOUR ON-LINE MUSCLES A LITTLE

CITY

To £6,800

+ subsidised mortgage

Data Communications ... International Real-Time Network IBM and Mini computer involvement ... future Data Base.
If you can see your career including these, then your requirements will probably comprise:
A high degree of personal project involvement; a young closely knit team of semi professionals; outstanding career opportunities; a commitment to a range of demanding applications in International Banking.
Our Client, having rapidly developed an excellent reputation in the banking field are able to offer all the above.

They have an eye for:
* Outstanding and undeveloped potential, and specifically seek a background including:
* 2 years' financial applications experience.

The career rewards are obvious. The financial package is excellent, and includes 3% mortgage, annual bonus, personal and season-ticket loan scheme, non-contributory pension and a range of other large company benefits.
It is envisaged that the Department will be re-locating to the Essex area by the end of 1978.

CW/10/8

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Freeport, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B32BR

MANCHESTER 061-833 0676 FREEPOST
Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST 6
Freeport 6, 102, Blandford Street, London W1E 1JZ



SCR

UNICOM

ANALYSTS/PROGRAMMERS/ MATHEMATICIANS

UNICOM Consultants specialise in Application Software in such diverse areas as:

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- Modelling Languages for Mathematical Programming
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- Compiler Writing

Our clients include leading computer manufacturers and computer bureaux in this country.

We have developed a powerful machine independent modelling language (UMIP) User Interface to Mathematical Programming.

Please write to: Dr. G. Mitra, UNICOM Consultants Ltd., 108 Kew Road, Richmond, Surrey. Tel: 01-840 7719/77.

We are looking for young graduates with formal training in computer science, mathematics or related disciplines

- to join a team to maintain, support and enhance our product, UMIP
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Preference given to 22+ years; we offer a salary in the range of £3,000-£4,000 (or more for suitable candidates), and positive plans for career promotion.

Persons with appropriate experience who wish to have part-time employment may also apply.

We offer a relaxed working environment and we are looking for persons with commitment and good team spirit.

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ANALYST/PROGRAMMERS £4,000/£6,300
PROGRAMMERS £3,800/£8,500

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Applicants will be invited to look through our client register which details the companies, positions, salaries, prospects, etc., so that they may jointly choose the vacancies best suited to their requirements and experience.

For more information ring:
HAYMARKET COMPUTING LTD.
Tel. Cuffley (Herts.) 4130
up to 7.00 p.m.



Burroughs

T.I.O. TECHNICAL INFORMATION ORGANISATION is an important support division of Burroughs. Headquartered in the London area — at Croydon — T.I.O. provides world-wide opportunities for involvement at all levels in the marketing support of products and is the link between our engineering and manufacturing facilities and our world-wide marketing organisation.

T.I.O. needs people who need a world-wide challenge either from a desk at headquarters, an office elsewhere in the U.K. or Europe, or 'in the field' — wherever the need arises — WORLD-WIDE.

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To join a team involved in the support of sophisticated systems software including Generators, Compilers, Interpreters and Utilities on brand new fourth generation computer systems, and intelligent terminals.

The successful candidate will be required to provide world-wide support and will become an acknowledged authority.

Applicants should have two to three years experience of systems software, data communications software and preferably ALGOL language on large systems. They should have a degree or H.N.D. in Computer Science.

Burroughs is moving very fast and so do the people who work for us. The challenge is there. The rewards are great.

If you can see an opportunity, write to P. Taylor or telephone on 01-686 0355. The address is Burroughs Machines Ltd. Technical Information Organisation, 512 Purley Way, Croydon, Surrey, CR0 4NZ.

World-Wide
Career
Opportunities



Burroughs

We're not offering you a job. We're offering you a future.

Training Role in Commercial Software Applications

The development of a new range of software for our client's range of minicomputers has created a new and advanced concept in languages and technology. Your main task will be to ensure that all their software support personnel are constantly updated and trained on new systems and applications whilst keeping a close brief on the company's future marketing objectives.
You should have a sound appreciation of minicomputers/business systems and how they relate to user problems across varied commercial disciplines. Previous training/instruction experience in the data processing field would be an obvious advantage. This position would suit a professional systems

man or woman who is looking for a more influential role within an expanding marketing unit.
Salary is negotiable up to £6,000 plus mileage and car allowance and interest free car loan. Relocation expenses are available to the pleasant country location in the South East. (Ref: S/8806/CW)

REPLIES will be forwarded direct, unopened and in confidence to the client unless addressed to our Security Manager listing companies to which they may not be sent. They should include comprehensive career details, not refer to previous correspondence with PA and quote the reference on the envelope.

PA Advertising

Hyde Park House, 60a Knightsbridge, London SW1X 7LE. Tel: 01-213 6040/41/2281



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For the applicant, the completion of one application form opens the door to a potential interview with many clients. Because we know our clients, we can save applicants time and give them much more information about the company they could be working for.

SYSTEMS ANALYST WEST OF LONDON

c. £5,500 + Low Mortgage

Our client is a large IBM user, running batch and T.P. work under DOS/VS. They are seeking persons with at least three years' experience and a programming background and would prefer 'A' level education or equivalent.
He/she will be expected to implement systems and lead others in programming and systems activities.
Subsidised restaurant, sports and social club and RELOCATION EXPENSES are also offered.
Contact: Brian Raine.

SENIOR PROGRAMMER LONDON Up to £5,700 + Profit Sharing

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Applicants should have two years' experience and a financial background would be an asset.
Excellent fringe benefits are offered including LOW MORTGAGE, FREE PENSION AND LIFE ASSURANCE, PAID NATIONAL HEALTH, CHEAP LOANS, ETC.
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Contact: Brian Raine.

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If you feel restricted by your present product or environment, or have a successful selling background in non-computer products, telephone to discuss this unique opportunity.
Contact: Steve Morpurgo.

Our consultants are here to help you. They will do everything possible to find you the job you want, and you will receive courteous advice and assistance with an honest valuation of your earnings potential. Interviews outside normal working hours will be gladly arranged.

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After 5.15 p.m. either ring 01-402 6627, or if there is no reply — 01-402 0933 for
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AJK CONSULTANTS
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Excellent working conditions, with NON-CONTRIBUTORY PENSION, life assurance and LVs, are offered.

Contact: Steve Morpurgo.

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FOUR WEEKS' HOLIDAY, staff canteen and excellent pension scheme accompany these positions.

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Contact: Steve Morpurgo.

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Our client has a high reputation for good training in programming, systems and electronic engineering.
They are seeking people of varied backgrounds to meet the ever increasing demand for training and education.
If you have programming experience, recent data processing experience, business experience or you are a teacher, contact us for a discussion about the next step in your career.

Contact: Brian Raine.

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AP2/4 £3021-£4194 inclusive
plus July 1977 National Pay Award

Applications are invited from persons with at least two years' programming experience together with some system analysis work.

The duties of the post will include analysing and designing systems and computer programming in R.P.G.II. The Council currently uses an I.C.I. 2803 computer.

The Computer Section is located in Dartford within easy reach of A2/M2 and Dartford British Railway Station (35 minutes London Bridge).

A generous disturbance and relocation scheme is in operation.

Further details and application form, returnable by 28th October, are available from Personnel Section, Manor House, Swanscombe, Kent OA10 0BS. Tel: Greenhithe 842431, Ext. 27.



DARTFORD
Borough Council

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Computer Personnel Consultants

SENIOR SYSTEMS ANALYST

Near PUTNEY c £6,750

This is an ideal opening for an Analyst with sound experience of commercial applications to lead a development team implementing a range of on-line applications. The person appointed will hold total responsibility for systems, incorporating distributive processing techniques, on 2900 hardware for which formal training will be given. Candidates should have experience of on-line applications and be able to communicate effectively with both users and technicians. The Company, a major British organisation, offers an excellent career with the opportunity to progress to main-line management. Benefits include Pension Scheme, 4 weeks' holiday, LVs and Flextime.

ANALYST/PROGRAMMER

LONDON c £5,500

An excellent opportunity exists for an experienced PROGRAMMER or ANALYST/PROGRAMMER seeking additional responsibility and career progression within a technically challenging environment. The successful candidate will work within a small department initially developing a unique on-line system to give positive control of the company's production stocks and distribution. Applicants should have at least three years' programming experience and be keen to develop their analysis skills. A number of areas have been identified for computerisation and offer good career prospects. Conditions of employment are first-class and also include a company discount scheme.

DEVELOPMENT PROJECTS

(Database and Communications)

W. LONDON

SENIOR ANALYST/PROGRAMMER To £7,000
ANALYST/PROGRAMMER To £5,750

These positions present an excellent opportunity for PROGRAMMERS or ANALYST/PROGRAMMERS, at all levels of seniority, now seeking to enhance their career in a progressive and challenging company offering outstanding potential to undertake complex projects. A number of applications are scheduled for implementation affording successful candidates the opportunity to gain extensive experience on systems using communications and database techniques. Applicants should have sound COBOL programming experience preferably gained using IBM or Univac equipment. They should have a flexible outlook and be able to function at all levels. Candidates for the senior positions should be capable of accepting project responsibility. The Company operates computing facilities on a world-wide basis and offers excellent conditions of employment including Non-Contributory Pension, LVs, Season Ticket Loans and Flexible Working Hours.

ANALYST/PROGRAMMERS

(Gain 2900 Experience)

S.W. LONDON

c £5,250

Analyst/Programmers with good COBOL experience are required to join a progressive department installing applications for a new ICL 2960 configuration. The successful candidates will work within project teams where they will be encouraged to develop their skills in analysis whilst gaining experience and training in large 2900 issues. A comprehensive plan of systems and programming activities has been established and the company offers a positive career path to the persons appointed. Excellent conditions of employment incorporate Flextime, LVs, 4 weeks' holiday and pension scheme.

Please telephone for a confidential discussion or write to:
30 Fleet Street London EC4Y 1AA
01-353 5868

Senior Analyst/ Programmer

An International shipping group require a Senior Programmer with experience in system design to text existing manual system prior to actual computerisation, advise on purchase of new installation, and organise the changeover to a computer based company. The suitable applicant will possess D.P. experience in programming and systems design in a financial/transportation environment and preferably controlled the implementation of at least one major commercial system. The position will be based in London, salary is negotiable and will reflect ability, experience and qualification but would not be less than £6,000 per annum.

Please write with full career history, quoting ref no. CW 1707 to the Security Manager, MCS Robertson & Scott Ltd., Friendly House, 21-24 Chiswell Street, London EC1Y 4UB.

MCS/Robertson & Scott

A member of the MCS group
Recruitment Advertising, Search, Selection
London, Darlington, Glasgow, Edinburgh, Aberdeen.

SYSTEMS SUPPORT

Salary £4000-£6000 p.a.

Expanding UK branch of Data Communications Corporation requires flexible person with software background to perform system support role. Data General experience essential, knowledge of COBOL and/or communications an advantage.

Contact: Mrs. A. Trembath
Data Communications Corporation
Thames House, 5 Church Street
Twickenham, Middlesex TW1 3NU
Tel: 01-892 9685

TRIPOLI, LIBYA ANALYST/PROGRAMMERS

Vacancies exist with a large petroleum company for two analyst/programmers to work on stimulating projects using an IBM 370/145 under OS.

Permanent employment is offered to experienced professionals who are able to satisfy the following pre-requisites:—

- 25 to 35 years of age
- male (marital status immaterial)
- a background of IBM mainframes and software
- at least 3 years' experience with PL/1 and one other language, preferably COBOL or BAL
- commercial systems experience gained in the petroleum industry would be an advantage

An extremely attractive, tax-free, financial package comprising salary, accommodation and benefits will be offered. Generous home leave with paid air fares will also be available.

Closing date for applications is 20th October, 1977.

Applications to:

altergo

Mr. C. DUNFORD
ALTERGO (PERSONNEL) LTD.
38 Soho Square
London W1V 5DF
Telephone No. 01-734 9681



c £4,000

PL/1 Programmer

The makers of G-Penn furniture are seeking a programmer with at least 18 months' PL/1 experience to join a small team.

The installation is a 370/125 operating under DQS/VS with POWER and we are currently implementing a trial T.P. Order Entry system under SHADOW/II.

The successful applicant will be expected to show considerable initiative and work with minimum supervision.

Apply, stating details of experience, to:
Company Personnel Manager
E. GÖMME LIMITED
P.O. Box 27
High Wycombe, Bucks.

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01-930 4163

RTZCS

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The Work

UCSL provides a computing service to commerce, industry and the professions as well as to many Unilever companies. Systems are developed to run on their IBM mainframes or through minis front-ending to them.

The work load is expanding steadily hence the need for more people.

A job to suit you?

Since the company is going to help you to develop into a senior data processing professional your actual entry point into the system is not particularly important. Your start point could be any of those listed below. At your interview the best entry point for you can be discussed and determined.

Junior programmer
Programmer
Senior Programmer
Programmer (Time-sharing)
Analyst/Programmer
Systems Analyst
Senior Systems Analyst
Project Manager

Programming Languages

Mainly Cobol, some PLI and Assembler, RAMIS, Easytrieve. For analysts some programming experience is desirable.

Has it got to be I.B.M.?

Your previous experience does not necessarily have to be on IBM equipment but those applicants with significant IBM experience will be able to fit into the working environment more quickly. This will obviously give them an edge over those who have not.

Further Information, Application Forms, Interviews

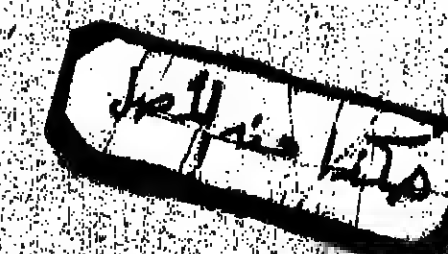
If you would like to be considered for one of these jobs or would simply like to talk about them, Roger Griffiths of Duncan Bransom Ltd. will be at UCSL's Head Office at Station House, Harrow Road, Wembley, Middlesex — telephone 01-903 1414. Why not drop in to see him or telephone him there any time on Friday 14th October, or from Monday to Friday 17th-21st October, inclusive, between the hours of 8.00 am and 7.00 pm. Interviews can be arranged while you wait.

After the 21st October, please contact him at the Duncan Bransom office at 37 Hillcrest Road, Loughton, Essex, telephone 01-508 5121.

Please write or telephone for an application form to:
Roger Griffiths, Duncan Bransom Ltd.
37 Hillcrest Road, Loughton, Essex.
Telephone: 01-508 5121



Duncan Bransom Limited



Informatix UK & O'seas Index

Phone 01-409 0468

Informatix Avon House 360 Oxford Street London W1N 9HA Telex 28800 LONDOFG



POSITION	SALARY	EMPLOYER	LOCATION	HARDWARE ENVIRONMENT	SOME OF THE QUALIFICATIONS	REF. NO.
Assembler Software Programmer	0m. 48,000 + Car	Minicomputer Manufacturer	South Germany	Mini	Well grounded in Mini Software with substantial exp. as Assembler.	41/1
P/L/I Applications Programmer	c. £5,000 + Mortgage	International Banking Corporation	East London & City	IBM 370/DS CICS & IMS	Sound PL/I exp. essential; any exposure to CICS or IMS will be an advantage. Training given.	41/2
COBOL or PL/I Analyst Programmer	c. £5,800 Overseas Travel	Software House	S.W. London	IBM OS/DS	3-5 yrs. COBOL or PL/I under either OS or DOS. Sound JCL and utilities exp., excellent career opportunity.	41/3
IMS Analyst Programmer	to £8,000 + Bonuses	Management Services Facility	North London/Middx.	IBM 370/DS	IMS OS/DS exp. essential preferably using PL/I. COBOL possible alternative. Very professional O.P. dept.	41/4
IBM/H/Well COBOL Programmer	c. £5,000	Computer Manufacturer	Central London	Honeywell 2000	2 yrs. COBOL exp. on any mainframe, preferably IBM or H/Well. Small well run installation.	41/5
IMS Applications Programmer	To £5,500 + All Bonuses	Management Services to Int'l Group	West London	IBM 370/MVS	2 yrs. + IMS OS/DS ideally using PL/I. One of the foremost installations in U.K.	41/8
Mini Analyst Programmer	c. £11,000 + Tax Allowance	International Systems & Software Group	Banbury	O.G. Interdata PDP etc.	Mini Software specialist and Communications/Messag Switching exp. Urgently required.	41/7
Banking Analyst	to £8,000 + Mortgage	U.S. International Banking Group	City	IBM 370/DS System 3	Very Senior post selling a person with sound Banking background able to handle exacting tasks.	41/8
Systems Analyst	c. £6,750	Re-insurance Group	Croydon	IBM 370/DS/VS	Analyst with 2 yrs. + exp. ideally with DOS background; might only Analyst Prog. with COBOL exp.	41/9
ICL COBOL/PLAN Applications Programmer	£4,500-£5,750	Banking	N.W. London/Middx.	ICL 1900/2900 MAXIMOP	2 yrs. + COBOL and/or Plan in ICL Environment. Good career prospects for right persons.	41/10
Univac/IBM COBOL Anal/Prog.	c. £5,100	Computer Bureau	Central London	Univac 1110	One of U.K.'s largest Comp. Bureau. Offer very challenging opportunity in COBOL Analyst Programmers.	41/11
Communications Specialists	c. £11,000 + Bonuses	Major Int'l Software House	Belgium	Minic/M. Frames	Exp. of Telephone/Telco end or Message Switching or General Communications.	41/12
IBM COBOL Programmer	c. £4,800 + Mortgage	Insurance	East Surrey	IBM 370/DS/VS	One of the Major Insurance Cos. Plenty of scope to develop career. COBOL is essential.	41/13
Team Leader	c. £8,200	Major Manufacturing Group	N.W. London	ICL 1900/2900	Plan and/or COBOL in an ICL environment essential. Important post with development potential.	41/14
PL/I or COBOL Sr. Analyst Programmer	£10,000-£14,000	International Systems and Bureau Group	Germany & Belgium	IBM 370/DS & System 4	Farwest Systems and Bureau Group. PL/I and/or COBOL under OS essential. Foreign language required for some posts.	41/15
BAL Sr. Systems Programmer	£5,850 + All Bonuses	Insurance	City	IBM 370/DS/VS CICS	Min. 2 yrs. BAL and 1 yr. DOS/VS. Gen. High level education an advantage, any exposure to CICS desirable.	41/18
Compiler Development Programmer	£6,000 + Car	Computer Manufacturer	West Middx.	Mini	Sound Assembler exp. Compiler background essential, any basic knowledge of COBOL an added advantage.	41/17
PL/I or COBOL Analyst Programmer	c. £6,500 + Travel Exp.	Software House	Central London	IBM 370/DS	While PL/I and/or COBOL are essential, willingness to travel on business extensively at times is the priority.	41/18
BAL Systems Programmer	c. £4,750 + Mortgage	Insurance	N.W. London/Middx.	IBM 370/DS	Rapidly expanding O.P. dept. offers genuine advancement opportunities in right persons.	41/19
PL/I CICS Programmer	c. £5,000 + Mortgage	Financial Institution	North London/Herts.	IBM 370/DS CICS	Senior PL/I Programmer ideally with exposure to CICS will be enhanced by these excellent posts.	41/20
Senior Systems Analyst	c. £8,500 + Car	U.S. Computer Manufacturer	West London/Middx.	Large Mainframes	U.S. travel and several very worthwhile perks go with these openings offering long term career minded people.	41/21
PL/I & COBOL Programmer	c. £5,000 Mortgage	Banking Management Services Group	City	IBM 370/DS	Sound PL/I, COBOL or BAL exp. in OS environment. Solid grasp of JCL and IBM utilities. Good documentation standards vital.	41/22
Senior Recruitment Consultant	Basic £6,000 + High Comm.	Informatix	Central London		Computer Recruitment exp. to essential. Aggressive and determined consultants will earn top rates in this field.	41/23

SOFTWARE SUPPORT ANALYSTS

c. £7000 + Car/allow. + Profit Sharing

Pre-/post-sales support for leading mini-computer manufacturer with extensive range of software applications.

PROGRAMMERS

c. £5000

Experience in Cobol for wide range of on-line, data-based management information systems and financial packages.

Ring Harvey Jacobs, 01-568 7795
BRYTEK STAFF CONSULTANTS
Star House, York Parade
Great West Road, Brentford, Middlesex

Systems Designer Computers

not less than £8,500

What distinguishes the first class development man or woman in any industry, and perhaps especially in computers, is that they are exciting. Partly this comes from the person, partly from the work environment. After a period of change and development, this major European computer manufacturer is now consolidating, both organisationally and in the world market. It has the excitement of hard work success and of confident expectation.

The systems designer they are looking for will be no bookroom person. The job is central, involving persuasive communication with one's directors, marketing people and implementers, so that fluency and clarity in expression are as vital as the imagination, initiative and technical skill needed to design the architecture for complex hardware and software systems. They are within easy reach of London. Age is less important than the quality of the experience, which is unlikely to have been gained in less than 10 years.

Write in complete confidence to:

J. P. Macfarlane, who is advising the company.

Beckwell Search

Associated Development Services Ltd
25 WILKINS STREET, LONDON W1M 1DL
Telephone: 01-409 1241 (24 hour answering service) Telex: 20326
ASSOCIATED WITH COMPANIES IN AUSTRALIA, BRITAIN, CANADA, FRANCE, ITALY, NETHERLANDS, SWEDEN, SWITZERLAND, U.S.A., WEST GERMANY

Severn Trent Water Authority invite applications from suitably qualified men and women for the following post in their Upper Trent Division:

Technical Assistant

Data and Statistics

(Ref: 07 EC 24)

Grade 6: £4148-£4476 p.a. plus up to £520 p.a. supplements.

Based at Burton-on-Trent the duties will include the preparation and reporting of management information, the maintenance of a general information service, the interpretation, collection and presentation of data and statistics for use in returns, forward planning and performance appraisal. Additional work will include assistance in the monitoring of progress and expenditure on capital schemes (budgetary control) including the use of computer print-outs and graphical presentation of data.

Applicants should be suitably experienced graduates. Application forms are available from the Personnel Services Officer, Severn Trent Water Authority, Upper Trent Division, Trinity Square, Nottingham Street, Burton-on-Trent. Telephone: Burton 4481.

Closing date: 27th October, 1977.

ANALYST/PROGRAMMER

KENT

c £5,000

This is an ideal opportunity for an analyst or programmer with a degree in a major IBM installation in Kent. You will find the job extremely challenging and stimulating. The company has a multi-million pound turnover and can offer a desirable salary, excellent benefits package and a secure future.

ASSEMBLER PROGRAMMER

SURREY/SUSSEX

to £4,500 + benefits

We have a number of vacancies in Surrey and Sussex for experienced Assembler Programmers with ASSEMBLER programming experience. All companies have IBM 370 mainframes, offer excellent conditions of employment including good training facilities and mortgage assistance. Those of our clients are located in rural surroundings.

COBOL PROGRAMMER

CROYDON

to £4,900

A well known manufacturing company is seeking a COBOL Programmer to join a large and growing team. They currently require several COBOL programmers with upwards of 18 months' experience in COBOL programming. The role is to develop and maintain COBOL programs for the company's financial systems. The successful applicant will be given every opportunity to progress with their career.

ANALYSTS

SURREY

to £6,500 + benefits

The high demand encountered in September for Systems Analysts in Surrey has continued. At the time of writing, we have 15 vacancies based on Surrey working in various areas of Systems Analysis. The companies range from financial institutions to manufacturing concerns and offer excellent career opportunities. If you are currently in a similar position, we must have a vacancy that can attract you.

SENIOR PROGRAMMER

BERKS./MIDDX. area

to £5,000

A senior programming position exists with an industrial group. Ideally the applicant should have COBOL, PL/I, and Algol 68 and II experience. A technical bent coupled with additional knowledge of the company's products would be an advantage. The position is to provide technical support as second person in the development of new products. The position is to provide technical support for two sites. IMS is an IBM 370/DS installation. The company offers flexible working hours, subsidised canteen, and excellent holiday arrangements.

PROGRAMMERS

MIDDLESEX

to £5,500

An established company in Middlesex is seeking programmers to join a team working on IBM 370/DS mainframes. The position is to provide technical support for two sites. IMS is an IBM 370/DS installation. The company offers flexible working hours, subsidised canteen, and excellent holiday arrangements.

PROGRAMMER

THAMES VALLEY

£4,500 - £6,000 (dependent on experience)

A well known manufacturing company is seeking a COBOL Programmer to join a large and growing team. They currently require several COBOL programmers with upwards of 18 months' experience in COBOL programming. The role is to develop and maintain COBOL programs for the company's financial systems. The successful applicant will be given every opportunity to progress with their career.

TRAINEE SYSTEMS PROGRAMMER

(Honeywell)

LONDON

£5-£6,000

Applications for programmers wanting to enter systems programming are invited. The desirable attributes are approximately two years' programming in COBOL, a knowledge of Honeywell operating systems, and a sound knowledge of GDS. This is an excellent opportunity to make a definite career step for the ambitious programmer.

SENIOR ANALYSTS

MID-ESSEX

To: £6,300

+ Ex-Benefits

Possibly the most attractively situated installation based in the countryside of mid-Essex. SENIOR ANALYSTS with a sound systems background, are required to enhance an extremely professional ANALYSIS team in work on new and interesting development projects. Preference will be given to those with an IBM 370 background coupled to some knowledge of programming, although our clients could be flexible if applicants possess the necessary potential and team leadership skills.

HONEYWELL PROGRAMMERS

ESSEX, N. LONDON

to £4,500 + BENEFITS

COBOL is the main requirement and if this experience has been gained on HIGGON range so much the better. For this experience, our clients offer first class career opportunities, new development work including teleprocessing/communications and extremely attractive working conditions.

COBOL PROGRAMMERS

HERTS.

to £4,800

Are you looking for greater opportunities, a fresh challenge, then consider our clients who are currently undergoing major hardware enhancements and as a result, wish to recruit additional professional staff with upwards of 18 months' good COBOL experience, preferably gained in an IBM environment. With the help of internal courses additional training will be given with the view to rapid promotion.

ANALYST/PROGRAMMERS

CITY

to £5,500 + Ex-Benefits

Our clients, a major financial institution, are seeking to recruit additional Analyst/Programmers with approximately 3 years' good COBOL experience gained on any machine. Some analysts experience would be preferred, but if you are currently a senior programmer with an ambition to move into ANALYSIS, this could be your opportunity. Please send us your CV and we will contact you if you are suitable for this position.

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WEST SCOTLAND

SYSTEMS ANALYST

£4300-£5200

ADVANCED PROGRAMMER

c £4200

Our client, a major engineering organisation with its headquarters in Glasgow, requires a Systems Analyst for their installation. Applicants should preferably have experience in production and inventory control systems. A strong, energetic personality is required.

In addition a programmer with a minimum of 3 years' experience (COBOL) is needed to join their professional programming section.

ANALYST/PROGRAMMER

Our client, a major construction company, have an NCR Century and candidates should have experience of financial systems and programming (Nest 3) on a similar machine. Applicants should have the ability to lead a team and take projects through from start to finish.

Relocation assistance is available for all these positions.

Contact Edinburgh office for further details: 031-226 5381

SOUTH WALES & THE WEST OF ENGLAND

PROGRAMMERS

£3500-£5000

Well qualified programmers are at a premium on both sides of the Severn Bridge in Gwent, Glamorgan, Gloucestershire, Avon, Somerset and Wiltshire. The vacancies are centred in the main areas of population, and offer various different types of application.

If your experience is on ICL or IBM Mainframe, or any mini equipment, and you can program in COBOL, PL/I, Fortran or Assembler you qualify as an applicant.

Salaries range from £3500 to £5000 p.a. depending upon experience and position applied for. All are accompanied by the usual large company benefits and relocation expenses will be met in most cases.

To find out more about these Welsh and West Country opportunities contact Bristol Office (0272) 211035

LONDON (01) 637 0781 MANCHESTER (061) 432 5857 BIRMINGHAM (021) 643 1994 BRISTOL (0272) 211035 EDINBURGH (031) 226 5381 CRAWLEY (0293) 514071
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Senior Programmers/Programmers

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We're looking for the best brains in the computer business. The innovators, the fresh thinkers, the dedicated ones who want to work with the best, and welcome the challenge that computerised supermarket retailing now offers.

We have a £500 m turnover through our 850 outlets and employ 19000 staff in various parts of the country. We've just installed the Burroughs B4700 to supplement our existing B3700. We are making heavy investments in the distributed processing field. We are linking Depot computers throughout the country with Head Office and planning to replace existing hardware for on-line systems work.

We're searching out that rare, restless breed who realise now that computers are about to revolutionise retailing. Those innovators who are full of enthusiasm over what computers could be doing. The ideas people who can get excited at the prospect of helping us to plot a computerised supermarket retailing revolution.

Here's the chance to put your special stamp of computer talent on the Superstore of the future. We're offering a challenge and a creative computer approach all the way from management, purchasing stock control and distribution right through to point of sale.

You'll be needed to help us plan and polish our projects. To dream up and develop the details. To systemise new shortcuts. To research original routines and to perfect fresh procedures.

If you have experience of high level languages, database, data communications or a background in on-line or other commercial systems development, we want to meet you. We don't want a detailed job application from you. We're far more

interested in what you can do, and would like to do, than in what you've already done. We'd really like to swap ideas with you. Hear how you feel about following up some fresh lines in our computer thinking.

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The Noke Hotel, Watford Road.

MANCHESTER October 18th,
The Midland Hotel, Peter Street.

HENDON October 19th,
Hendon Hall Hotel, Ashley Lane.

LEEDS October 19th,
Merrion Hotel, Merrion Centre.

LUTON October 20th,
Stratmore Hotel, Arndale Centre.

GLASGOW October 20th,
MCS House, 23 Park Circus.

STEVENAGE October 21st,
Rothwell Hotel, Old London Road.

Alternatively, if you can't make it, telephone or write to

C.L. Hopkins, Computer Services Manager
Fine Fare Ltd, Gate House
Welwyn Garden City, Herts.

(Office hours tel: Welwyn Garden City (07072) 28140
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central systems
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Ref: No. 1C/37/CW.



For application form please telephone our 24 hour recruitment helpline 01-627 9959 or send a postcard to the Chief Executive, Camden Borough of Camden, Town Hall, Euston Road, London NW1 2RU stating postcard reference number.

SYSTEMS ANALYSTS

£4,500-£5,250

MR. ESHER
Systems Analysts between 21-35 who have at least one year's systems experience are required by a large company. Programming 0 & M or language experience would be an advantage.

PROGRAMMERS £3,329-£4,027

Programmers with two years' experience. One year with IBM COBOL and/or ASSEMBLER required to write and modify programs, system development areas not work on them.

SENIOR PROGRAMMER C. £4,750

STAINES
Programmer with RPG II experience for IBM Systems 3. Leading experience and accounting applications useful. Prospects of system involvement.

SHIFT LEADER £3,913 - £4,758

BITT
Senior Operator with supervisory experience of at least one year in a shop by an IBM 370 installation using DOS/POWER/CICS. Two shift system. Please phone for an Application Form.

**AMES
PERSONNEL**
TELEPHONE: 01-767 0611

TSB TRUST COMPANY LTD

Systems Development Manager

Hampshire Salary c.£7,000

TSB Trust Company Limited, its head office situated in the heart of the Hampshire countryside at Andover provides the 10 million customers of the Trusts Savings Bank group with insurance and unit trust services through the 1,700 TSB Branches throughout the U.K.

The organisation is expanding rapidly and the Management is committed to computing as the prime tool for both operating and managing the Company. A Burroughs 83700 is scheduled for delivery early in 1978 and development of a completely new integrated system covering all aspects of the business is now starting. The system will use Database concepts and will include substantial on-line and real time facilities. A Systems Development Manager is now required to take full responsibility for this development project. He/she will have project teams drawn from internal staff and from an outside software contractor reporting to them. Significant experience of developing Database and real time systems is therefore a prerequisite for the successful applicant.

Salary will be negotiable from £7,000 and the fringe benefits are those to be expected from a large organisation.

Write for an application form to:

Alan Willis

Personnel Manager,

TSB Trust Company,

White Bear House,

21 Cherry Way,

Andover, Hants.

Tel: Andover 62188

Completed application forms should arrive not later than 25th October 1977

TSB

Analyst Programmers

Coventry

We have recently replaced our original Honeywell 125 Computer with a Honeywell Level 64/30 and as part of our long-term plans for the development of both batch and on-line applications we now wish to recruit additional Computer Systems Analyst/Programmers to strengthen our existing team.

We would be interested to hear from men and women with at least two years' programming experience who are looking for the opportunity to develop their Computer skills in a commercial environment with responsibility for both programming and systems work.

The Society offers a pleasant working atmosphere, excellent conditions of employment and competitive rates of pay.

If you would like to be considered for one of these appointments please write giving details of age, education, job history and present rate of pay to: Mr. M. Thompson, Assistant General Manager, Personnel, Coventry Economic Building Society, 28, 30 & 32, Little Park Street, Coventry CV1 1JF.

**COVENTRY ECONOMIC
Building Society**

CURRENT SELECTION

Operators to Shift
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LONDON & HOME COUNTIES

We have many vacancies covering all types of machines and locations. Some firms will retain from one manufacturer to another. Remember these positions are for shift working only. Hurry whilst stocks last.
CW41/1. Patricia.

Programmer
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Have you COBOL or ASSEMBLER experience (any byte machine)? If you do then this Finance organisation using the latest Univac equipment would like to see you. Terrific perks including a subsidised canteen, N.C.P.S. free life assurance, four weeks' hols. and a swimming pool on the premises.
CW41/2. Annette.

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UX

Your experience is required now. A very large number of vacancies are registered where a knowledge of Assembler or communications experience is essential (VRC programmers would also be considered). Opportunities exist in S.W., N.W. or W. London, Surrey, Herts. and Manchester in this exciting and rewarding field. There has also been registered some overseas posts to people with five or more years in mini computers.
CW41/3. Michael.

Systems Analyst
To £6,950

VICTORIA

Have you designed and installed a major system on a large computer (IBM preferred)? If you have then this famous Petro-Chemical company would be very interested in seeing you. Now and improved Business Reporting applications await you. Company benefits include four weeks' hols., free life insurance, C.P.S. and L.V.s
CW41/4. Annette.

Successful Salesmen
to £12K quota earnings

UX

We now have 12 different firms for both hardware and systems only companies who are anxious to meet successful salesmen in this industry. They must have previous relevant small systems experience (some VRCs will be considered). All firms have bonus schemes and car allowances. Most positions in S.E. England, but three in Midlands.
CW41/5. Michael.

Systems Consultants
£6,000 - £9,500

CENTRAL LONDON

Seven large well-established consultancies wish to recruit systems people with all-round experience on third generation equipment and the right personality to deal with clients who require a first rate service. Technical communications consultants are also required where in-depth implementation experience of IBM or ICL/T/P message switching networks, etc., are essential. Excellent fringe benefits and prospects.
CW41/6. Michael.

Contract Programmers
to £190 p.w.

UX

Immediate requirements for IBM RPG II & IBM COBOL under DOS or OS for C. London. PL/1, OS or CICS, PDP/11 or good IMS for various locations for three months plus. Also IBM vacancies in GERMANY, BELGIUM & HOLLAND. Ask for the Contracts Officer on 01-995 2238.
CW41/7. Michael.

PLEASE EITHER COMPLETE THE FORM ALONGSIDE OR TELEPHONE UCA FOR DETAILS OF THESE AND SIMILAR VACANCIES.

01-995 3883
CONTRACT STAFF
01-995 2236

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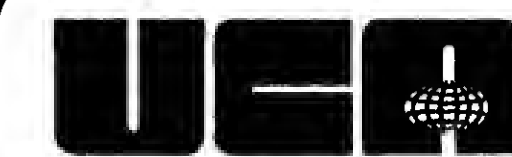
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Address		Telephone (home)	
		(used discreetly) (work)	
		Ext.	
Age		Position required	
Marital status		Salary required	
Period of notice		Areas required	
Children's ages		Willing to move? Within UK: Yes/No	
Car owner / driver		Overseas: Yes/No	
Foreign languages?		Areas considered	
Education — 'O' / 'A' levels / degrees / other		Installation preferred	
EOP contacts		Join a progressive software house / Consultancy / Bureau?	
		Yes/No	
		Interested in freelance work?	

EMPLOYMENT RECORD			
Dates & final salary (most recent first)	Employers (most recent first)	Computer & model	Programme languages & operating systems
			Position, duties and applications undertaken and completed

EDP EXPERIENCE			
Time period to nearest quarter year: Operating	Programming	Sales / other	Total in DP
Control procedures	Systems	Management	
Languages and operating systems you know well			
Assess your experience: S = some, A = adequate, F = full (leave blank if not relevant) of the following			
VRC/Word Processing	Time Sharing	Database Design	JCL
Drum	Disk	MICR/OCR	VDU
Software development	Scientific programming	Production control	Accountancy
			Real time

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 Highland House
 58 Waterloo Street
 Glasgow G2
 041-2218193

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MYRIAD OPERATIONS

Computer Personnel Consultants

OPERATOR AND SHIFT LEADER

LONDON c.£3500-c.£4300

The expansion and re-organisation of our client's data processing operations has created a need for additional personnel. To support a steady growth in the company's business, a more powerful IBM System 370 mainframe is being installed to replace their existing machine. A variety of batch and online applications are processed revolving around an extensive CICS TELE-PROCESSING NETWORK. Operators are largely responsible for controlling the T.P. system.

Prospects for progression within the installation are first class, being enhanced by a comprehensive induction and training scheme, and the company's determination to provide maximum motivation and opportunity.

Applications are invited from men and women who, in the case of the Shift Leader, feel they are capable of controlling a busy computer room. Candidates for the post of Operator should have at least one year's experience and feel ready to pursue an active and demanding career.

Please telephone for a confidential discussion or write:
 30 Fleet Street London EC4Y 1AA
 01-353 5868

Guy's Hospital Medical School

SENIOR PROGRAMMER

There is a requirement to take charge of the Medical School Computer Centre. The successful candidate will be responsible for the day-to-day running of the Centre and will be expected to develop and improve the Centre's performance.

Applicants should have a degree in Computer Science or equivalent and preferably should have some experience in programming in a high level language. The successful applicant will be encouraged to continue computer science for medical staff and in work for a higher degree in some aspect of medical computing.

Salary on scale £2,955-£4,100 (inc. £4,811, plus £450 London Allowance).

Apply in writing, stating age and giving details of qualifications and experience to the Secretary, Guy's Hospital Medical School, London Bridge SE1 8RY, quoting Ref. G.P.S.

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SHIFT LEADER

City Insurance Co require a person with 4 years' experience for a 2 shift system. 370, DOS, POWER and CICS London, EC3 Ref. 213

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 City Insurance Co require a person with 4 years' experience for a 2 shift system. 370, DOS, POWER and CICS London, EC3 Ref. 213

OPERATOR

£3400 +
 City Insurance Co require a person with 4 years' experience for a 2 shift system. 370, DOS, POWER and CICS London, EC3 Ref. 213

OPERATOR

£3220
 City Insurance Co require a person with 4 years' experience for a 2 shift system. 370, DOS, POWER and CICS London, EC3 Ref. 213

PROGRAMMER/ANALYST

£6,000
 Analyst position with 2-3 years' Cobol, IBM DOS background, for this company in London. WC2, Ref. 194

PROGRAMMER

£5,000
 Cobol, 2 years' experience, IBM DOS background, London, WC2, Ref. 194

SYSTEMS ANALYST

£5,500 +
 2-3 years' experience and some RPG II, for a position in London, NI Ref. 210

ANALYST/PROGRAMMER

£5,500 +
 RPG II knowledge plus 3 years' analysis experience, to set up the system for a new installation, IBM SPS 32, Surrey, Ref. 211.

SYSTEMS ANALYST

£5,000 +
 2-3 years' analysis plus some Cobol knowledge and an IBM 370 DOS background for this organisation in London, BW7, Ref. 199.

To discuss these or our unadvertised appointments in more detail and in the strictest confidence, call X-Calibur on 01-353 8201/3 or write to 47 Essex Street, London WC2E 3JF.

Computing Services Association
 (Licence No. BEA) 2487

X-Calibur

COMPUTER AUDITING

Touche Ross & Co., Chartered Accountants, wish to recruit for two positions in their Computer Auditing Department, which is based in the London office.

TRAINING MANAGER

Up to £7,000

The work will cover the presentation of courses in the areas of computing, computer systems, and the firm's own software system, STRATA. There will be an ongoing requirement to maintain and develop the existing courses to keep pace with relevant developments in computing. The recipients of this training include not only all levels of staff within the firm but also clients' internal audit and D.P. staff. Candidates should have experience in the following areas:

- financial systems design and implementation
- development and presentation of training courses
- working knowledge of at least one IBM operating system, preferably O.S.

This is an interesting position for an experienced data processing professional since it involves advising specialist computer auditors and audit client personnel on the technical aspects of computing.

This is an excellent opportunity to become involved in a wide variety of installations encompassing most important types of hardware and software. At the more advanced level there will also be some responsibility, in the U.K., for the technical support of the firm's software system, STRATA, which is commonly used on IBM and Burroughs hardware as part of the firm's normal audit procedures.

Candidates should have experience in all the following areas:

- financial systems design and implementation
- programming in COBOL and Assembler
- working knowledge of at least one IBM operating system, preferably O.S.

Both positions will report to the Partner in charge of Computer Auditing in the U.K. firm, and opportunities exist for travel to North America and Europe. Some knowledge of the audit of computer systems would be a considerable advantage, although the necessary training in this and STRATA will be provided. This will be supplemented by involvement in client work to gain the necessary practical experience.

Fringe benefits include the firm's car scheme, contributory pension scheme, long life insurance and disability schemes and four weeks' annual holiday.

Please apply for an application form to: A. T. Gardner-Brown, Touche Ross & Co., 3 London Wall Buildings, London EC2M 6PH. Tel: 01-688 3878.

TECHNICAL SUPPORT MANAGER

Up to £7,000

This is an interesting position for an experienced data processing professional since it involves advising specialist computer auditors and audit client personnel on the technical aspects of computing.

This is an excellent opportunity to become involved in a wide variety of installations encompassing most important types of hardware and software. At the more advanced level there will also be some responsibility, in the U.K., for the technical support of the firm's software system, STRATA, which is commonly used on IBM and Burroughs hardware as part of the firm's normal audit procedures.

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IBM SHIFT LEADER

£4780
 Our client, a major financial organisation, requires a Shift Leader with a minimum of 3 years' IBM 370 experience. The successful applicant will be responsible for the day-to-day running of the system and will be expected to develop and improve the system's performance.

Applications are invited from operators with a good knowledge of the system and who are prepared to work on a shift basis. The successful applicant will be responsible for the day-to-day running of the system and will be expected to develop and improve the system's performance.

Two of the Senior positions carry subsidised mortgage and other reasonable benefits.

S. LONDON IBM OPERATOR

£4000
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Are you looking for an opportunity to get out of a rut and:

- work on differing hardware, learn new operating systems
- gain experience in on-line systems, both mainframe and mini
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We are recruiting for a leading British computer consultancy, with offices in the main commercial centres. They have a high reputation for professional, quality work, and most assignments come to them by recommendation. The majority of the work is in the Greater London area and absence from home is limited. However, opportunities for travel in the U.K. and overseas can occur.

This opportunity will interest career-minded, presentable and articulate programmers with upwards of two years' sound experience on any hardware.

For an initial confidential discussion, please ring us for a free brochure quoting ref. 640. Messages after hours will be recorded.

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Mini Computer Real Time Software Bristol Up to £6,400

Applications are invited for an appointment in the Computer Applications group of the Scientific Services Department. The group is actively engaged in developing real time system software for micro computers to be used for on line data acquisition, monitoring and control of the Board's plant.

The successful candidate will be in his/her twenties, and have a good degree in computing science or an equivalent qualification. Substantial experience with PDP 11 assembler code is essential and familiarity with CORAL 66 would be an advantage. The candidate will be an innovator ready to justify and implement new system software ideas on computers in power stations.

The post will be based at the new laboratories Badminster Down, Bristol but will be located at Porchester until early 1978. Visits to power stations throughout the Region will be a necessary part of the work.

Applications on Form AF17 obtainable from the Personnel Manager, Central Electricity Generating Board, 15-23 Oakfield Grove, Clifton, Bristol, should be completed and returned to him quoting Vacancy Number R207/77CW by not later than 28th October 1977.

Scientific Services Department - South Western Region

Systems/Programming Steel Stockholding

British Steel Service Centres Group is responsible for the stockholding activities of the British Steel Corporation. It has warehouses and sales offices throughout the United Kingdom and sells some 500,000 tonnes of steel each year.

The Group is launching a major programme of computerisation involving considerable expenditure on software and hardware over the next few years. Of primary importance are systems being introduced for order handling and stock control which will involve sophisticated 'on line' arrangements. Work is also going ahead on the Sales and Purchase Ledgers, Payrolls and other accounting activities.

To undertake this work programme, a Systems and Programming Section is being established in Sheffield and the following vacancies are available:—

SENIOR ANALYSTS/PROGRAMMERS ANALYSTS/PROGRAMMERS

Applicants for both levels of vacancy should have a good standard of general education and 'on line' experience would be particularly desirable. Candidates for Senior Analyst/Programmer should have at least four years' systems/programming experience and for the Analyst/Programmer vacancy, a minimum of two years' experience.

Applications can be made, or further information obtained by contacting: Brian G. Rees, Group Personnel Manager, British Steel Service Centres, Whitwell House, Whitwell Road, Haslewan, West Midlands, B83 3LF Telephone No. 021-650 9221

BRITISH STEEL SERVICE CENTRES

ANALYSTS/PROGRAMMERS

£4,500 to £8,500

Programmers and Analyst/Programmers urgently needed for newly announced Time Sharing company

Minimum 1 year commercial PDP experience necessary — we operate on PDP 11/35's and 11/70 — and knowledge of data communications an asset but not obligatory

Sited at Amersham in Bucks., we offer large company benefits plus extensive technical and business training. Salary £4,500 to £8,500 depending on experience

Interested? Then ring or write: John O'Connell, Buzal Data Systems, Meteor House, White Lion Road, Amersham, Bucks. Tel: Little Chalfont (02946) 4458.

Scandinavia

We need experienced Systems Consultants to assist one of our major clients in the development of a complex real-time system on IBM, Univac and Digital equipment.

You must have:

- * at least 3 years programming experience
- either * practical experience of IBM 370 with assembler and a good working knowledge of IMS under OS.
- or * a practical experience of PDP11 with a good working knowledge of RSX11M and FORTRAN.
- or * practical experience of Univac 1100 using EXEC 8.

The total salary package will be very attractive to people at the moment working in the United Kingdom. Interviews will be held in London during November for appointments early in 1978.

Please write, initially to:

J. A. Taylor, Resources Manager,
SPL International,
12/14 Windmill Street, London W1P 1HF.
or telephone 01-636 7833

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SVENSKA

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SENIOR PROGRAMMER/ANALYST Up to £5000 AND A GRADUATE TRAINEE Up to £3500

Location: Chiswick, London

A major international manufacturing group requires a senior analyst and a graduate trainee for its DP Department which uses an IBM System/3 Model 42.

For the senior programmer/analyst position the ideal candidate will have:

- a good PDP 11 background
- a knowledge of COBOL
- implemented at least two commercial systems
- some 3-4 years DP experience

For the graduate trainee position the ideal candidate will have a degree in computer science.

This position offers responsibility for the day-to-day operation of the DP section and the successful applicant's initial duties will be to assist the development and implementation of the many existing systems planned for the future possibly leading to the implementation of a Model 315 or 370.

Please forward in complete confidence curriculum vitae, advising of any organisations to whom you would not like your application referred.

Shelagh Felgate
CMG Computer Management Group
(Middlesex) Ltd
Westway House, 320 Ruslip Road East
GREENFORD, Middlesex UB6 9BW
Telephone: 01-578 4563

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ANALYST PROGRAMMER

Required for our Head Office in New Malden, Age group 20-30 with at least 18 months experience on PDP 11 programming, preferably the NCR Century 76. On-line knowledge would be advantageous.

In return for the above, we offer a good salary together with the usual company benefits.

Please write to Mr. C. M. Dorch, with brief details: High and Hill Limited, Crown House, Kingston Road, New Malden, Surrey.

Our jobs are open to persons of either sex and advertisement should be considered as such.

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Hard work will get high
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Hard work will get high
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rewards.

IBM ANALYST

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When we are looking for a man in his late 20's or early 30's with at least three years' experience, much of that on systems involving data communications. He must have a disciplined approach to the job and be capable of supplying the driving force for the whole operational team.

We offer around £8,000 p.a. plus a car, big company benefits, and the chance to be one of the most responsible positions in the company.

If you are interested please ring or write: John O'Connell, Bund Data Systems, Meteor House, White Lion Road, Amersham, Bucks. Tel: Little Chalfont (02946) 4458.

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You should have systems experience and be capable of combining major projects and tasks with maintaining existing systems and users to ensure successful implementation.

You will be working in a pleasant environment with an outstanding major project and effectively managing the Kent County Council, West Malling, Kent, is a busy town.

If you would like to know more, please Ron Wilson on West Malling (0732) 845848 or write for an application form to the Computer Manager, Computer Unit, Kent County Council, West Malling, Kent, or to the Computer Unit, West Malling, Kent. Closing date 27 October.

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1916 December 1977

On the basis of Short Courses in MICROPROCESSORS AND THEIR ON-LINE APPLICATION.

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Appointments are part-time, preferably term-time only, of three/four hours of the appropriate subject, on the basis of £2,904-£4,911 plus £450 London Allowance. Applications and further details may be had from: The Personnel Officer, Technical Staff, City University, College London, Gower Street, WC1E 6BT.

Systems Engineer

c. £7,000 + overseas allowance Greece

This is a unique assignment with an international minicomputer company to work for a two year period in their Greek office, and an individual remuneration package will be negotiated around £7,000 plus overseas allowances. After this period other opportunities will then be offered within the worldwide group. The project is already at an advanced stage — a PDP11 Duplex installation managing ninety financial terminals in various configurations for real-time bank counter work, plus off-line terminals for batch transmission of other data.

To be considered, you must have experience of designing on-line minicomputer systems, and programming and project management experience of a PDP11 installation operating under RSX11 or similar. REPLYES will be forwarded direct, unopened and in confidence to the client unless addressed to our Security Manager, listing companies to which they may not be sent. They should include comprehensive career details, not refer to previous correspondence with PA and quote the reference on the envelope.

PA Advertising

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GA

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THE SALES BIT

Monday mornings — and other myths

WE used to have a regular routine. Every Monday morning each salesman was expected to complete his claim for business expenses, update the prospect hot list and complete any outstanding call-reports from the previous week.

By and large the arrangement worked quite well; but there was one character who regularly missed the midday deadline. However, he was also the company's most successful salesman, which earned him a little extra flexibility and, as a result, the situation never became a problem.

One day I asked why only he was regularly absent from the office on Monday mornings. To my surprise he told me it was one of his best times for meeting clients and prospects. To all intents and purposes he was an average fellow, with none of the articulate charisma that the uninformed normally associate with salesmen.

However, analysis showed that he constantly had a prospect portfolio at least twice as big as any other salesman and a call-rate which was similarly in excess of that achieved by any of his colleagues. In fact his ability to make more calls than his fellow salesmen, thus generating more prospects, was due almost entirely to his refusal to accept any of the common myths concerning the time parameters which are supposed to govern the scheduling of appointments.

Many salesmen believe that selling cannot generally be conducted on Monday mornings, Friday afternoons, before 10 am or after 4.30 pm and between the hours of noon and 2.30 pm; the notable exception being the occasional lunch-time appointment which can often be related more to self-indulgence than selling. The very fact that this belief is so widespread makes these apparently unavailable hours of business particularly fruitful to the more objective salesman.

It also begs the question as to whether the typical lack of face-to-face sales activity at the beginning and end of the week is more a function of inadequate salesmen than reluctant buyers. The most important call is the first call of the day, for it tends to dictate the pattern of subsequent sales activity. A familiar and extremely negative approach to planning sales calls is to assume that everyone has masses of post in process every day which excludes all other events until it is cleared.

Another negative assumption, particularly in London, is that most people do not reach their offices until after 9.30 am. The answer is quite simple. Always attempt to make the first appointment each day for 8.30 am. You will soon discover, and therefore be able to note, which people are usually around at that time.

You will be surprised how many bosses normally arrive at work before 8.30 am or are willing to come in a little earlier to see you. Most organisations do not finish distributing their mail until well after 9.30 am which gives plenty of time for discussion before the postal ritual. Appointments after 4.30 pm are typically more difficult to arrange than in the early morning, but nevertheless many bosses are prepared to stay until 6 pm and beyond if they believe they can discuss a product which might be beneficial to their company, particularly with someone who is also prepared to give up a little of his own time.

As far as lunchtime is concerned, the determined and well organised salesman can work right through the lunchtime period if need be. This ability is purely a function of keeping effective client records.

There are two fairly consistent features of lunch periods. They normally last for one hour and typically begin any time between 12 noon and 1.30 pm; ie many people have returned from lunch before others have commenced. The question is who lunches when, and that is where detailed client records are essential.

Most salesmen within the DP industry could double their existing call rate by utilising their selling time more effectively, and the implications of such an increased workrate would bring significant rewards for both salesman and company alike.

Of course there are many disciplines and techniques which can contribute towards such improvement, but none can bring more significant results than simply getting to the first call by 9 am at the latest every day, knowing which clients 'lunch' when, and disregarding any generalisations about 'proper' and 'improper' times to call.

THE TRADER

Sleeve-bearing fans

A RANGE of sleeve-bearing fans for the electronics, computer, aerospace and allied industries has been introduced by ETRI Fans.

The fans combine low cost with noise levels of between 38 to 42 decibels for a 2,800 to 3,200 revolutions per minute unit.

Designated the 133 Series, they are available in three versions, covering speed ranges of 2,800 to 3,200; 2,200 to 2,600; and 1,600 to 1,800 revolutions per minute. The three-blade units range from 21 to 25 litres per second for the lowest speed version and from 38 to 44 litres per second for the fastest unit.

Puzzle answer

THE simple formula:

$xy/(x+y)$

where x and y are the wall heights, gives the height of intersection regardless of alley width in our particular case this comes to 66/20 or 3.3 feet.

LIVERPOOL POLYTECHNIC

Department of Computer Services

CHIEF OPERATOR GRADE T3

ICL1903A-64K

Salary scale: £3,395-£3,773 p.a.

Application forms and further particulars are available from the Personnel Office, Liverpool Polytechnic, Richmond House, 1 Rumford Place, Liverpool, L3 9RH. Tel: 051-227 5581, Ext. 43

Please quote reference LP 19286/83

A CAREER WITH ALEX. LAWRIE

Alex. Lawrie is a leading British Factoring Company with an annual turnover currently approaching £100m. We specialise in providing finance for commerce and industry.

At present we have the following vacancy:

SENIOR COMPUTER OPERATOR

We are looking for a Senior Operator to work on our ICL 19017 configuration which has magnetic tapes, EDS BC's, VOU's and other equipment.

The successful applicant will have a minimum of two years' experience on an ICL or compatible machine and as the Operations Department works a 24 hour three shift system he or she will show the ability to take on the role of Shift Leader within a short time.

The usual range of Company benefits are available.

If you are interested in this vacancy please get in touch with: Mr. M. J. Parsons, Personnel and Training Manager, Alex. Lawrie Factors Ltd., Beaumont House, Beaumont Road, Banbury, Oxon OX16 7BN. Telephone: Banbury 4481